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Administrative Committee of the European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)

Draft amendments to the Regulations annexed to ADN*

At its twentieth session (26 January 2018), the ADN Administrative Committee requested the secretariat to prepare a consolidated list of all the amendments it had adopted for entry into force on 1 January 2019 so that they could be made the subject of an official proposal in accordance with the procedure set out in article 20 of ADN. The notification would have to be issued no later than 1 July 2018, with a reference to 1 January 2019 as the scheduled date of entry into force (see ECE/ADN/44, paragraph 19).

The present document contains the requested consolidated list of amendments adopted by the Administrative Committee at its twentieth session on the basis of those proposed by the Safety Committee at its thirty-second session (see ECE/ADN/44, paragraph 18 and ECE/TRANS/WP.15/AC.2/66, Annex I under cover of ECE/TRANS/WP.15/AC.2/66/Add.1). These amendments have been prepared by the Safety Committee at its twenty-ninth, thirtieth, thirty-first and thirty-second sessions (see ECE/TRANS/WP.15/AC.2/60, ECE/TRANS/WP.15/AC.2/62, ECE/TRANS/WP.15/AC.2/64 and Corr.1 and ECE/TRANS/WP.15/AC.2/66, Add.1 and Corr.1).

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Chapter 1.1

1.1.3.1 (b) Delete and insert "(b) *(Deleted)*".

1.1.3.5 The amendment does not apply to the English text.

1.1.3.6.2 (d) and (e) Amend the indents to read as follows:

"- closed containers;

- sheeted vehicles or sheeted wagons;".

1.1.4.2.1 In the first sentence and in (c), after "containers," insert "bulk-containers,".

1.1.4.3 Amend footnote 2 to read as follows:

"[2] *The International Maritime Organization (IMO) has issued "Revised guidance on the continued use of existing IMO type portable tanks and road tank vehicles for the transport of dangerous goods" as circular CCC.1/Circ.3. The text of this guidance can be found on the IMO website at:* www.imo.org.".

Chapter 1.2

1.2.1 In the definition of "*Hold*":

- At the beginning of the sentence, delete "(when anti-explosion protection is required, comparable to zone 1 — see Classification of zones)".

1.2.1 In the definition of "*Cargo pump-room*":

- At the beginning of the sentence, delete "(when anti-explosion protection is required, comparable to zone 1)".

1.2.1 Amend the definition of "*Protective shoes (or protective boots)*" to read as follows:

"*Protective shoes (or protective boots)* means shoes or boots which protect the wearer's feet during work in a danger area. The choice of appropriate protective shoes or boots shall correspond to the dangers likely to arise, especially those caused by electrostatic charging/discharging, and meet the requirements of international standard ISO 20345:2012 or ISO 20346:2014.".

1.2.1 In the definition of "*Cargo tank*":

- At the beginning of the sentence, delete "(when anti-explosion protection is required, comparable to zone 0)".

1.2.1 In the definition for *"Cargo tank (gas free)"*, amend the end to read "…dangerous gases and vapours.".

1.2.1 Amend the definition of *"Hermetically closed tank"* to read as follows:

"*Hermetically closed tank* means a tank that:

– is not equipped with safety valves, bursting discs, other similar safety devices or vacuum valves; or

– is equipped with safety valves preceded by a bursting disc according to 6.8.2.2.10 of ADR, but is not equipped with vacuum valves.

A tank intended for the carriage of liquid substances with a calculation pressure of at least 4 bar or intended for the carriage of solid substances (powdery or granular) regardless of its calculation pressure is also considered hermetically closed if it:

– is equipped with safety valves preceded by a bursting disc according to 6.8.2.2.10 of ADR and vacuum valves, in accordance with the requirements of 6.8.2.2.3 of ADR; or,

– is not equipped with safety valves, bursting discs or other similar safety devices, but is equipped with vacuum valves, in accordance with the requirements of 6.8.2.2.3 of ADR.".

1.2.1 In the definition of *"Classification of zones"*, replace *"Classification of zones"* by "*Classification of explosion hazardous areas*".

At the end of the definition, add: "See also classification of zones".

1.2.1 In the definition of *"Cofferdam"*:

- At the beginning of the sentence, delete "(when anti-explosion protection is required, comparable to zone 1)".
- In the third sentence, after "The bulkhead not facing the cargo area", add "(outer cofferdam bulkhead)".
- Does not apply to the English text.

1.2.1 In the definition of *"Flame arrester"*, amend the final sentence to read as follows:

"The flame arrester shall be tested according to the international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] ECE/TRADE/391[3] or at least equivalent) shall be supplied;".

1.2.1 Amend the definition of "*Flammable gas detector*" to read as follows:

"*Gas detector*: a portable device allowing measurement of any significant concentration of flammable gases below the LEL and which clearly indicates the concentration of such gases. Gas detectors may be designed for measuring flammable gases only, but also for measuring both flammable gases and oxygen. This device shall be so designed that measurements are possible without the necessity of entering the spaces to be checked.

The maximum detection level of the sensors is 5 % of the LEL of the most critical substance in the vessel substance list for tank vessels or the cargo for dry cargo vessels. The flammable gas detector shall be certified according to IEC/EN[4] 60079-29-1:2016. If it is used in explosion hazardous areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] the IECEx System,[5] ECE/TRADE/391[3] or at least equivalent) shall be supplied;".

1.2.1 In the definition of *"Hold space"*, delete "(when anti-explosion protection is required, comparable to zone 1)".

1.2.1 In the definition of *"Steady burning"*, replace "EN ISO 16852:2010" by "ISO 16852:2016[1]".

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[1] *Identical to EN ISO 16852:2016.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

[4] *IEC/EN means: This standard is available as an IEC standard and as a European standard.*

[5] *http://iecex.com/rules.*

1.2.1 Amend the definition for *"Protective gloves"* to read as follows:

"Protective gloves means gloves which protect the wearer's hands during work in a danger area. The choice of appropriate gloves shall correspond to the dangers likely to arise (see for example European standards EN 374-1:2016, EN 374-2:2015 or EN 374-4:2013). In the case of dangers caused by electrostatic charging/discharging, they shall meet the requirements of standard EN 16350:2015.".

1.2.1 In the definition of *"Protective suit"*:

- Amend the third sentence to read as follows: "For protective suits, see for example, ISO 13688:2013."
- At the end, add the following sentence: "In case of dangers caused by electrostatic charging/discharging, see also European standard EN 1149-5:2008.".

1.2.1 Amend the definition of *"Gas detection system"* to read as follows:

"Gas detection system: a steady state monitoring system with direct-measuring sensors capable of detecting in time significant concentrations of flammable gases at concentrations below their (LEL) and capable of activating the alarms when a limiting value is exceeded. It has to be calibrated at least for n-Hexane. The threshold level of the sensors shall be set at not more than 10 % of the LEL of n-Hexane.

It shall be certified according to IEC/EN[4] 60079-29-1:2016 and, with electronically driven systems, also according to EN 50271:2010. If it is used in explosion hazardous areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] the IECEx System,[5] ECE/TRADE/391[3] or at least equivalent) shall be supplied;".

1.2.1 In the definition of *"Manual of Tests and Criteria"*, after "ST/SG/AC.10/11/Rev.6", insert "and Amend.1".

1.2.1 In the definition of *"Animal material"*, replace "or animal foodstuffs" by "foodstuffs or feedstuffs derived from animals".

1.2.1 In the definition of *"Limited explosion risk electrical apparatus"*:

- In the first sentence, replace the words "the required temperature class" by "200 °C".
- Amend the final paragraph to read as follows: "or means an electrical apparatus with at least an enclosure protected against water jets (protection rating IP55 or higher) which during normal operation does not exhibit surface temperatures above 200 °C.".

1.2.1 Delete the definition *"Certified safe type electrical apparatus"*.

1.2.1 Amend the definition of *"Sampling opening"* to read as follows:

"Sampling opening means a closable opening of a cargo tank with a diameter of not more than 0.30 m. When the vessel substance list according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, it shall be deflagration safe, capable of withstanding steady burning for the most critical substance in

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[4] *IEC/EN means: This standard is available as an IEC standard and as a European standard.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[5] *http://iecex.com/rules.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

the vessel substance list and so designed that the opening period will be as short as possible and that it cannot remain open without external intervention.

The deflagration safety shall be tested according to international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] ECE/TRADE/391[3] or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack capable of withstanding steady burning or a flame arrester capable of withstanding steady burning (protection against deflagrations);".

1.2.1 Amend the definition of "*Oxygen meter*" to read as follows:

"*Oxygen meter* means a portable device allowing measuring of any significant reduction of the oxygen content of the air. An oxygen meter may either be a device for measuring oxygen only or part of a combination device for measuring both flammable gases and oxygen. This device shall be so designed that measurements are possible without the necessity of entering the spaces to be checked. It shall be tested according to IEC/EN[4] 50104:2010. If it is used in explosion hazardous areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] the IECEx System,[5] ECE/TRADE/391[3] or at least equivalent) shall be supplied;".

1.2.1 Amend the definition of "*Flash-point*" to read as follows:

"*Flash-point (Fp)* means the lowest temperature of a liquid at which its vapours form a flammable mixture with air;".

1.2.1 In the definition of "*Opening pressure*", amend the first sentence to read as follows: "*Opening pressure* means the pressure referred to in column (10) of Table C of Chapter 3.2 at which the pressure relief valves/high-velocity vent valves open.".

1.2.1 In the definition of "*Receptacle for residual products*", at the beginning of the first sentence, delete: "a tank,". At the end, insert a new second sentence to read as follows:

"The receptacle shall be approved according to ADR, RID or the IMDG Code and authorized for the substance concerned. The maximum permissible capacity of an intermediate bulk container is 3 m^3, and that of a tank-container or portable tank is 12 m^3;".

1.2.1 Amend the definition of "*Receptacle for slops*" to read as follows:

"Receptacle for slops means a fire resistant receptacle capable of being closed with a lid intended to collect slops which are unsuitable for pumping. The receptacle shall be approved according to ADR, RID or the IMDG Code and authorized for the substance concerned. The maximum permissible capacity is 450 *l*. It should be easy to handle and marked "SLOP" (character height: 0.10 m);".

1.2.1 In the definition of "*UN Model Regulations*", replace "nineteenth" by "twentieth" and replace "(ST/SG/AC.10/1/Rev.19)" by "(ST/SG/AC.10/1/Rev.20)".

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[1] *Identical to EN ISO 16852:2016.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

[4] *IEC/EN means: This standard is available as an IEC standard and as a European standard.*

[5] *http://iecex.com/rules.*

1.2.1 Amendment to the definition of "*Restes de cargaison*" in the French text does not apply to the English text.

1.2.1 In the definition of "*GHS*", replace "sixth" by "seventh" and replace "ST/SG/AC.10/30/Rev.6" by "ST/SG/AC.10/30/Rev.7".

1.2.1 Amend the definition of "*High-velocity vent valve*" to read as follows:

"*High-velocity vent valve* means a pressure relief valve designed to have nominal flow velocities which exceed the flame velocity of the explosive mixture, thus preventing flame transmission. When the vessel substance list according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, this pressure relief device shall be tested in accordance with international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] ECE/TRADE/391[3] or at least equivalent) shall be supplied;".

1.2.1 Amend the definition of "*Vacuum valve*" to read as follows:

"*Vacuum valve* means an automatically activated safety valve the purpose of which is to protect the cargo tank against unacceptable negative internal pressure. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, it shall be deflagration safe against atmospheric explosions of the most critical substance in the list of substances. The deflagration safety shall be tested according to international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] ECE/TRADE/391[3] or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack or a flame arrester (protection against deflagrations);".

1.2.1 In the definition of "*Pressure relief device*", replace "a spring-loaded device which is activated automatically by pressure" by "an automatically activated safety valve".

1.2.1 In the definition of "*Control temperature*", replace "or the self-reactive substance" by ", the self-reactive substance or the polymerizing substance".

1.2.1 Amend the definition of *Toximeter* to read as follows:

"*Toximeter* means a (trans)portable device allowing measuring of any significant concentration of toxic gases and vapours. The device has to comply with standard EN 45544-1:2015, EN 45544-2:2015, EN 45544-3:2015 and EN 45544-4:2016 or with standard ISO 17621:2015.

If this device is used in explosion hazardous areas it shall be in addition suitable to be used in the respective zone and it has to be proven that the applicable requirements are fulfilled

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[1] *Identical to EN ISO 16852:2016.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

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[1] *Identical to EN ISO 16852:2016.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

(e.g. conformity assessment procedure according to Directive 2014/34/EU[2], or to ECE/TRADE/391[3] or at least equivalent).

This device shall be so designed that such measurements are possible without the necessity of entering the spaces to be checked.".

1.2.1 Amend the definition of "*Types of protection*" to read as follows:

"*Types of protection*:

Electrical equipment (see IEC 60079-0:2014 or at least equivalent);

EEx (d): flameproof enclosure (IEC 60079-1:2014 or at least equivalent);

EEx (e): increased safety (IEC 60079-7:2016 or at least equivalent);

EEx (ia) and EEx (ib): intrinsic safety (IEC 60079-11:2012 or at least equivalent);

EEx (m): encapsulation (IEC 60079-18:2014 or at least equivalent);

EEx (p): pressurized apparatus (IEC 60079-2:2015 or at least equivalent);

EEx (q): powder filling (IEC 60079-5:2015 or at least equivalent);

Non-electrical equipment (see ISO 80079-36:2016 or at least equivalent);

EEx (fr): flow restricting enclosure (EN 13463-2:2005 or at least equivalent);

EEx (d): flameproof enclosure (EN 13463-3:2005 or at least equivalent);

EEx (c): constructional safety (ISO 80079-37:2016 or at least equivalent);

EEx (b): control of ignition source (EN 13463-6:2005 or at least equivalent);

EEx (k): liquid immersion: (EN 13463-8:2003 or at least equivalent);".

1.2.1 Delete the definitions of "*Cargo area*", "*Part of the cargo area below deck*", "*Cargo area (main part above deck)*" and "*Cargo area (additional part above deck)*", including the figures. Add the following definition:

"*Cargo area*: the whole of the following spaces on board tank vessels:

Space below deck:

The space between two vertical planes perpendicular to the centre-line plane of the vessel, which comprises cargo tanks, hold spaces, cofferdams, double-hull spaces and double bottoms; these planes normally coincide with the outer cofferdam bulkheads or hold end bulkheads.

Space above deck: the space which is bounded:

- Athwart, by ships vertical planes corresponding to the side plating;
- Fore and aft, by vertical planes at the height of the outer cofferdam bulkheads/hold end bulkheads;
- Upwards, by a horizontal plane 2.50 m above deck.

The boundary planes fore and aft are referred to as the 'boundary planes of the cargo area';".

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[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations 2011.*

1.2.1 In the definition of "Explosion danger areas", replace "Explosion danger areas" by "Explosion hazardous areas". Add the following sentence at the end: "Explosion hazardous areas are classified into zones by frequency of occurrence and duration of the presence of an explosive atmosphere. See also *Classification of explosion hazardous areas, Explosion protection, Classification of zones* - for tank vessels and *Protected area* - for dry cargo vessels.".

1.2.1 In the definition of "*Protected area*":

- At the beginning, add the following sentence: "The whole of the following spaces on board of dry cargo vessels:".
- Delete "comparable to" (twice).

1.2.1 Add the following definitions in alphabetical order:

"*Over-moulded cylinder* means a cylinder intended for the carriage of LPG with a water capacity not exceeding 13 l made of a coated welded steel inner cylinder with an over-moulded protective case made from cellular plastic, which is non-removable and bonded to the outer surface of the steel cylinder wall;".

"*Equipment category* (see Directive 2014/34/EU[2]) means the classification of equipment to be used within explosion hazardous areas determining the requisite level of protection to be ensured.

Equipment category 1 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and ensuring a very high level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are present continuously, for long periods or frequently.

Equipment in this category must ensure the requisite level of protection, even in the event of rare incidents relating to equipment, and is characterized by means of protection such that:

- Either, in the event of failure of one means of protection, at least one independent second means provides the requisite level of protection; or
- Or the requisite level of protection is assured in the event of two faults occurring independently of each other.

Equipment of category 1 according to Directive 2014/34/EU[2] is marked as II 1 G. Such equipment corresponds to EPL[7] 'Ga' according to IEC 60079-0

Equipment of category 1 is suitable for use in zones 0, 1 and 2.

Equipment category 2 comprises equipment designed to be capable of functioning in conformity with the operational parameters established by the manufacturer and of ensuring a high level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are likely to occur occasionally.

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[7] *The letters EPL mean: Equipment Protection Level.*

The means of protection relating to equipment in this category ensure the requisite level of protection, even in the event of frequently occurring disturbances or equipment faults which normally have to be taken into account.

Equipment of category 2 according to Directive 2014/34/EU[2] is marked as II 2 G. Such equipment corresponds to EPL[7] 'Gb' according to IEC 60079-0.

Equipment category 2 is suitable for use in zones 1 and 2.

Equipment category 3 comprises equipment designed to be capable of functioning in conformity with the operating parameters established by the manufacturer and ensuring a normal level of protection.

Equipment in this category is intended for use in areas in which explosive atmospheres caused by mixtures of air and gases, vapours or mists or by air/dust mixtures are unlikely to occur or, if they do occur, are likely to do so only infrequently and for a short period only.

Equipment in this category ensures the requisite level of protection during normal operation.

Equipment of category 3 according to Directive 2014/34/EU[2] is marked as II 3 G. Such equipment corresponds to EPL[7] 'Gc' according to IEC 60079-0.

Equipment of category 3 is suitable for use in zone 2.".

"*Classification of zones*: this classification (see diagram) applies to tank vessels when the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2.

Zone 0 comprises:

- Inside all cargo tanks, tanks for residual products, receptacles for residual products and receptacles for slops, and pipings containing cargoes or cargo vapours, including their equipment, as well as pumps and compressors.

Zone 1 comprises:

- All spaces located below deck in the cargo area not part of zone 0.
- Closed spaces on deck within the cargo area.
- The deck in the cargo area over the entire width of the vessel to the outer cofferdam bulkheads.
- Up to a distance of at least 1.60 m to the "boundary planes of the cargo area", the height above the deck is 2.50 m, but at least 1.50 m above the highest piping carrying cargoes or cargo vapours.

  Adjacent (fore and aft) to the outermost cargo tank bulkheads, the height is 0.25 m above deck.

  If the ship is built with hold spaces or a cofferdam/part of a cofferdam is arranged as a service space, the adjacent height (fore and aft) to the "boundary plane of the cargo area" is 1.00 m above deck (see diagram).
- Every opening in zone 0 except the high velocity vent valves/safety valves of pressurized cargo tanks shall be surrounded by a cylindrical zone 1 having at least a width of 2.50 m. With openings of which the diameter is less than 0.026 m (1"), the distance to the outer

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[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[7] *The letters EPL mean: Equipment Protection Level.*

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[7] *The letters EPL mean: Equipment Protection Level.*

cofferdam bulkhead may be reduced to 0.50 m, provided it is ensured that such an opening is not opened to the atmosphere within this distance.

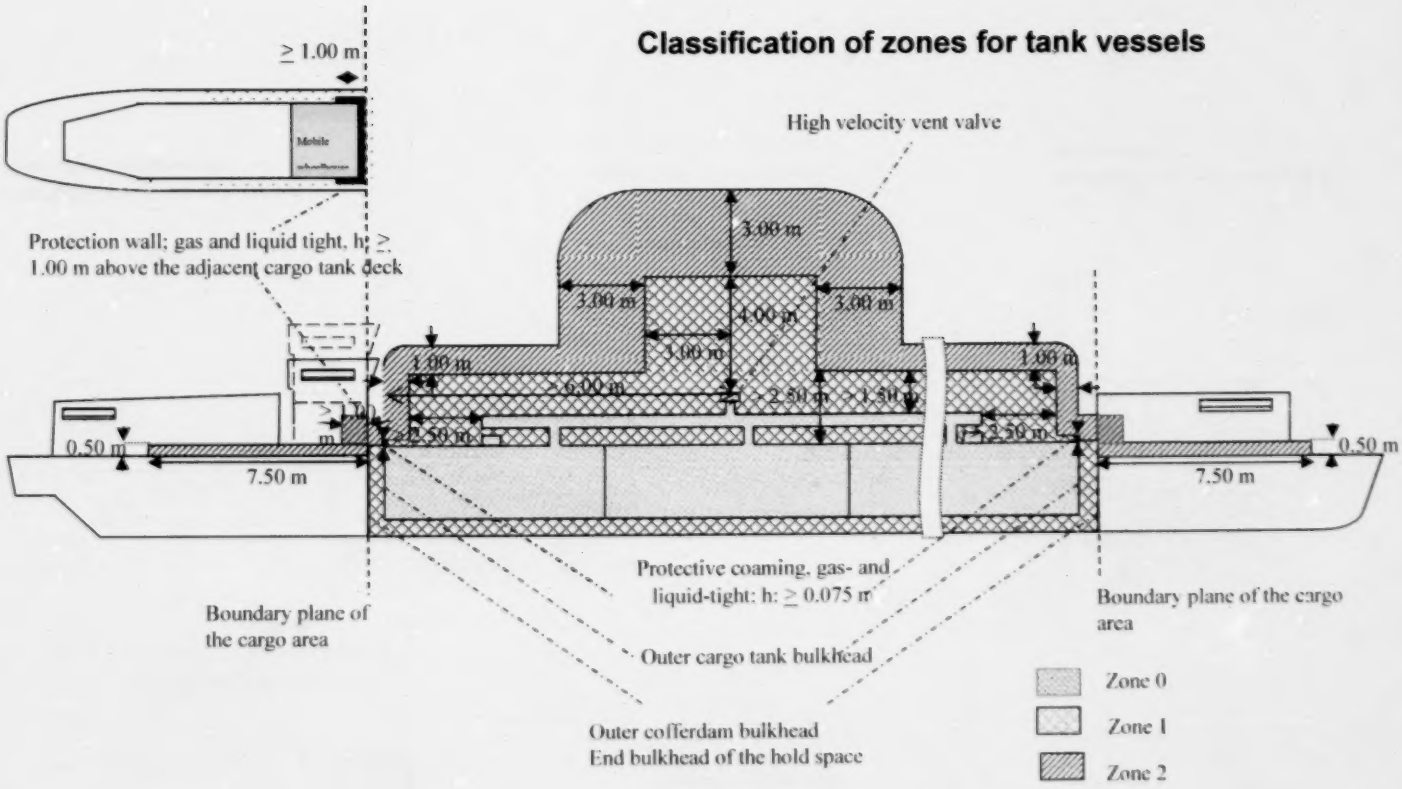
- A cylindrical area surrounding the high velocity vent valve/safety valve of pressurized cargo tanks with a radius of 3.00 m up to a height of 4.00 m above the opening of the high velocity vent valve/safety valve of pressurized cargo tanks.
- Around ventilation inlets of service spaces fitted with a ventilation system located in the cargo area, a zone included in a portion of a sphere with a radius of 1.00 m.

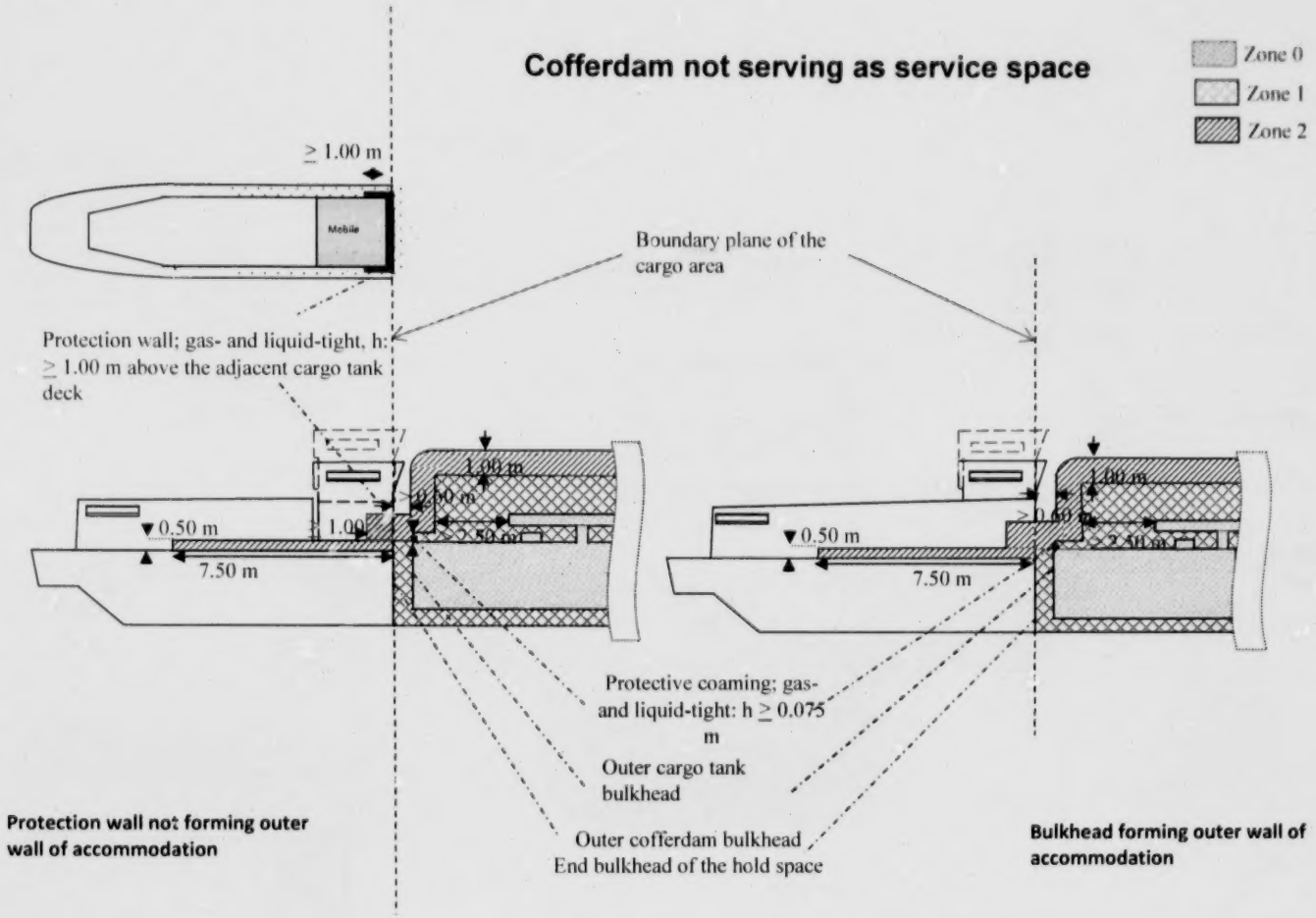
Zone 2 comprises:

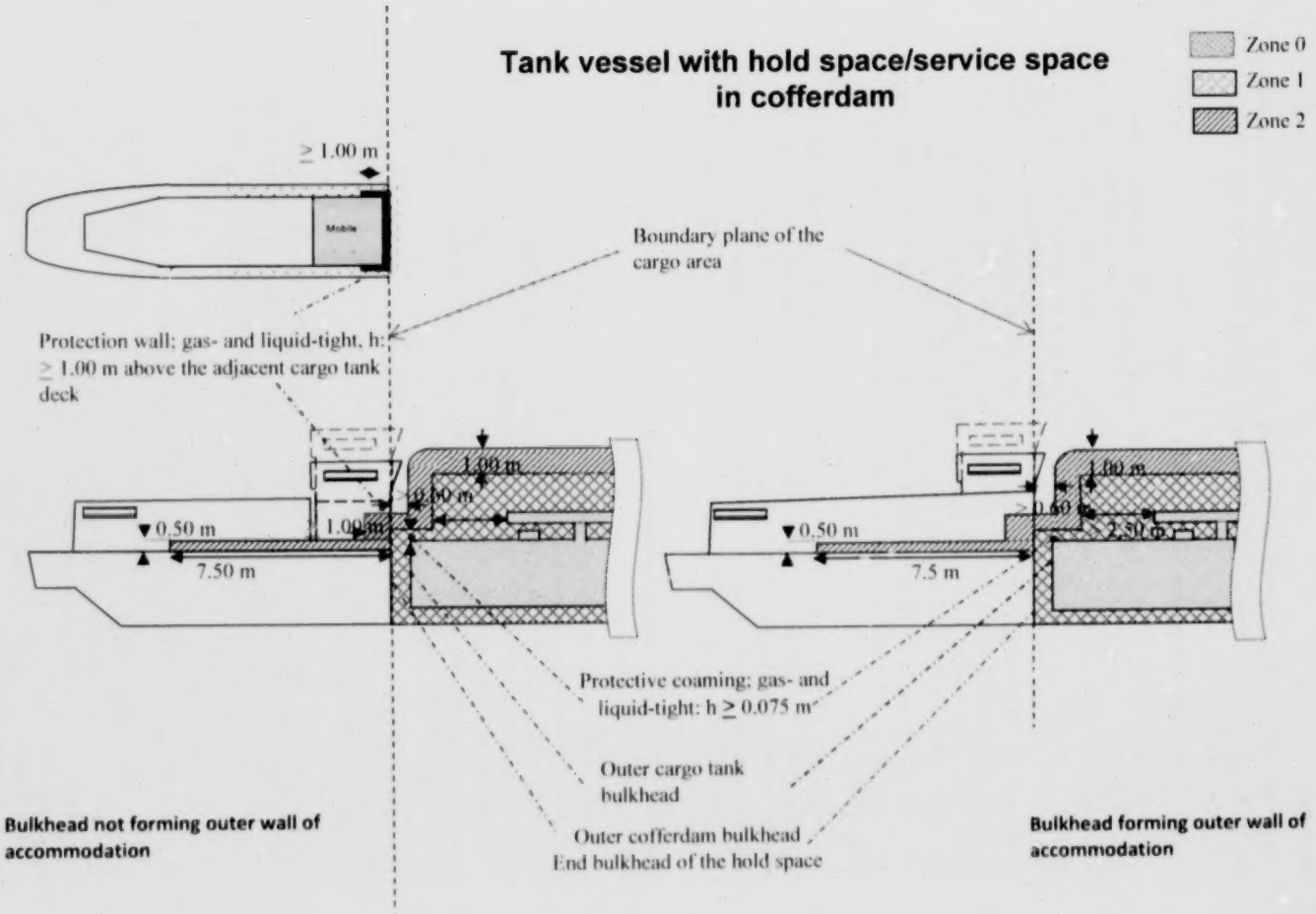
- On the deck in the cargo area, a zone extending 1.00 m upwards and sidewards longitudinally from zone 1.
- On the fore deck and the aft deck, an area 7.50 m in length across the entire width of the vessel and adjacent to the "boundary plane of the cargo area". Between the lateral side of the vessel and the protection wall, the length and height of this area equals the dimensions of the lateral side of the protection wall. Elsewhere, the height in zone 2 is 0.50 m.

  This area is not part of zone 2 if the protection wall extends from one side of the vessel to the other and there are no openings.
- An area of 3.00 m extending around zone 1 encompassing the high velocity vent valves/safety valves of pressure cargo tanks.
- Around the ventilation inlets of service spaces fitted with a ventilation system located in the cargo area, a zone included in a hemispherical shell with a radius of 1.00 m extending around zone 1;".

Classification of zones for tank vessels




Cofferdam not serving as service space
Zone 0
Zone 1
Zone 2
≥ 1.00 m
Mobile
Boundary plane of the cargo area
Protection wall; gas- and liquid-tight, h: ≥ 1.00 m above the adjacent cargo tank deck
1.00 m
2.50 m
0.50 m
1.00
7.50 m
Protective coaming; gas- and liquid-tight: h ≥ 0.075 m
Outer cargo tank bulkhead
Outer cofferdam bulkhead
End bulkhead of the hold space
Protection wall not forming outer wall of accommodation
Bulkhead forming outer wall of accommodation


Tank vessel with hold space/service space in cofferdam
Zone 0
Zone 1
Zone 2
≥ 1.00 m
Boundary plane of the cargo area
Protection wall; gas- and liquid-tight, h: ≥ 1.00 m above the adjacent cargo tank deck
1.00 m
0.60 m
0.50 m
1.00 m
7.50 m
1.00 m
0.60 m
0.50 m
2.50 m
7.5 m
Protective coaming; gas- and liquid-tight: h ≥ 0.075 m
Outer cargo tank bulkhead
Outer cofferdam bulkhead
End bulkhead of the hold space
Bulkhead not forming outer wall of accommodation
Bulkhead forming outer wall of accommodation

"*Protection wall, gas- and liquid-tight* means a gas- and liquid-tight wall on deck at the height of the boundary plane of the cargo area preventing gases from entering areas outside the cargo area;".

"*Degassing* means an operation with the aim of lowering the concentration of dangerous gases and vapours in empty or unloaded cargo tanks by emitting them to the atmosphere or to reception facilities;".

"*Diameter* (for shells of tanks) means the internal diameter of the shell.".

"*Device for the safe depressurization of cargo tanks* means a manually operated or remote-operated device which is mounted in such a way as to allow the cargo tanks to be depressurized in safety. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the device shall be deflagration safe and capable of withstanding steady burning for the most critical substance in the vessel substance list. The deflagration safety shall be tested according to international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] ECE/TRADE/391[3] or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack capable of withstanding steady burning or a flame arrester capable of withstanding steady burning (protection against deflagrations);".

"*Equipment* (see Directive 2014/34/EU[2]) means electrical or non-electrical machines, apparatus, fixed or mobile devices, control components and instrumentation thereof and detection or prevention systems which, separately or jointly, are intended for the generation, transfer, storage, measurement, control and conversion of energy and/or the processing of material and which are capable of causing an explosion through their own potential sources of ignition.

Equipment and articles which are assigned a UN number and transported as cargo are not included;".

"*Equipment intended for use in explosion hazardous areas* means electrical and non-electrical equipment where measures are taken to prevent the equipment's own ignition sources becoming effective. Such equipment shall comply with the requirements for use within the respective zone. It shall be tested according to the type of protection and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] the IECEx System,[5] ECE/TRADE/391[3] or at least equivalent) shall be supplied;".

"*Spill coaming* means a coaming on deck of the vessel parallel to the side plating with closable openings, to prevent spillage of liquids overboard. The connection to the protective coamings, if installed, shall be liquid tight;".

"*Protective coaming, liquid-tight* means a liquid-tight coaming on deck at the height of the outer cargo tank bulkhead (see zoning diagram), but at a maximum distance of 0.60 m to the outer cofferdam bulkhead or hold end bulkheads, which prevents liquid from entering the

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[1] *Identical to EN ISO 16852:2016*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[5] *http://iecex.com/rules.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

fore and aft parts of the vessel. The connection between the protective coamings and the spill coaming shall be liquid tight;".

"*Oxygen measuring system* means a steady-state monitoring device capable of detecting in time any significant reduction of oxygen content of the air and capable of activating the alarms in case the oxygen concentration reaches 19.5 % by volume.

This device shall be tested according to the European standard IEC/EN[4] 50104:2010. If it is used in explosion hazardous areas, it shall also comply with the requirements for use in the zone concerned and evidence of such compliance (e.g., conformity assessment procedure according to Directive 2014/34/EU,[2] the IECEx System,[5] ECE/TRADE/391[3] or at least equivalent) shall be supplied.

An oxygen measuring system may also be designed as part of a combination measuring system for measuring both flammable gases and oxygen;".

"*LEL*: see *Lower explosion limit*.".

"*Lower explosion limit (LEL)* means the lowest concentration of the explosion range at which an explosion can occur;".

"*Upper explosion limit (UEL)* means the highest concentration of the explosion range at which an explosion can occur;".

"*UEL*: see *Upper explosion limit*.".

"*Equipment protection level* (EPL[7] (see IEC 60079-0)) means the level of protection assigned to equipment based on its likelihood of becoming a source of ignition.

EPL 'Ga':

Equipment with a 'very high' level of protection. Such equipment corresponds to equipment category 1 according to Directive 2014/34/EU.[2]

Equipment with the 'Ga' level of protection is suitable for use in zones 0, 1 and 2.

EPL 'Gb':

Equipment with a 'high' level of protection. Such equipment corresponds to equipment category 2 according to Directive 2014/34/EU.[2]

Equipment with the 'Gb' level of protection is suitable for use in zones 1 and 2.

EPL 'Gc':

Equipment with an 'enhanced' level of protection. Such equipment corresponds to equipment category 3 according to Directive 2014/34/EU.[2]

Equipment with the 'Gc' level of protection is suitable for use in zone 2;".

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[4] *IEC/EN means: This standard is available as an IEC standard and as a European standard.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[5] *http://iecex.com/rules.*

[3] *A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere, United Nations, 2011.*

[7] *The letters EPL mean: Equipment Protection Level.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

"*Ullage opening* means a closable opening of the residual cargo tanks with a diameter of maximum 0.10 m. The ullage opening shall be designed in such a way that it is possible to determine the degree of filling by the use of gauging rods;".

"*Explosion range* means the range of the concentration of a flammable substance or mixture of substances in air, within which an explosion can occur, respectively the range of the concentration of a flammable substance or mixture of substances in mixture with air/inert gas, within which an explosion can occur, determined under specified test conditions;".

"*Explosion protection* means all of the requirements which have to be met and means which have to be taken to avoid damage caused by explosions.

This includes:

Organizational measures such as, for example:

(a) Determining explosion hazardous areas (classification of zones): in which an explosive atmosphere consisting of a mixture with air of flammable gases, vapours or sprays is likely to occur:

- continuously or for long periods or frequently (zone 0);
- occasionally in normal operation (zone 1); or
- exceptionally or only briefly (zone 2);

(see Directive 1999/92/EC[6]).

(b) Prevention of ignition sources (use of low-sparking hand-tools, no smoking, use of personal protective equipment including dissipative shoes, non-isolating gloves, etc.);

(c) Drafting of working instructions.

And technical requirements such as, for example:

(a) Use of installations and equipment proven to be appropriate for use in the different explosion hazardous areas;

(b) Use of self-contained protection systems;

(c) Monitoring of potentially explosive atmospheres by the use of gas detection systems and gas detectors;".

"*Protective lining* (for tanks) means a lining or coating protecting the metallic tank material against the substances to be carried;".

NOTE: *This definition does not apply to a lining or coating used only to protect the substance to be carried.*".

"*Reception facility* means a stationary or mobile facility for receiving gases and vapours during degassing of empty or unloaded cargo tanks and piping for loading and unloading;".

"*Self-contained protection systems* means all devices which are intended to halt incipient explosions immediately and/or to limit the effective range of an explosion and which are separately made available on the market for use as self-contained systems. This includes flame arresters, high velocity vent valves, deflagration safe vacuum valves and devices for the safe depressurization of cargo tanks capable of withstanding a deflagration (see also Flame arrester, High velocity vent valve, Vacuum valve, Devices for the safe depressurization of cargo tanks and Deflagration);".

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[6] *Journal of the European Communities No. L 23 of 28 January 2000, p. 57.*

Chapter 1.3

1.3.2 Insert the following new sub-section 1.3.2.5:

"1.3.2.5 Working instructions concerning explosion protection

The safety training referred to in 1.3.2.3 shall be supplemented by working instructions concerning explosion protection.".

Chapter 1.4

1.4.2.2.1 (f) Amend to read as follows:

"(f) Ensure that, within the explosion hazardous areas on board the vessel, only electrical and non-electrical installations and equipment that meet the requirements for use in the relevant zone are used;".

1.4.2.2.1 Insert a new subparagraph (k) to read as follows:

"(k) Complete his section of the checklist referred to in 7.2.3.7.2.2 prior to the degassing of empty or unloaded cargo tanks and piping for loading and unloading of a tank vessel to a reception facility.".

1.4.2.2.1 Add a new subparagraph (l) to read as follows:

"(l) Complete his section of the checklist referred to in 7.2.4.10 prior to the loading and unloading of the cargo tanks of a tank vessel.".

1.4.2.2.2 Add the following new sentence at the end: "In the case of 1.4.2.2.1 (c) he may rely on what is certified in the "container, vehicle or wagon packing certificate" provided in accordance with 5.4.2.".

1.4.3.3 (r) After "prescribed in 7.2.4.25.5", insert "and when explosion protection is necessary according to column (17) of Table C of Chapter 3.2".

1.4.3.3 (s) Replace "at the crossing-point of the gas discharge pipe or the compensation pipe" by "at the connecting-point of the vapour return piping and the venting piping" and replace "the opening pressure of the high velocity vent valve" by "the opening pressure of the pressure relief valve/high velocity vent valve".

1.4.3.7.1 (i) Amend to read as follows:

"(i) Ascertain that, when a connection to the venting piping is required and when explosion protection is required according to column (17) of Table C of Chapter 3.2, there is a flame arrester in the vapour return pipe to protect the vessel against detonations and flame-fronts from the landward side;".

1.4.3.7.1 (j) Replace "at the connecting-point of the gas discharge pipe or the gas return pipe" by "at the connecting-point of the vapour return piping and the venting piping" and replace "the opening pressure of the high velocity vent valve" by "the opening pressure of the pressure relief valve/high velocity vent valve".

1.4.3.7.2 Amend to read as follows:

"1.4.3.7.2 If the unloader makes use of the services of other participants (cleaner, decontamination facility, etc.) or of the pumps of the vessel he shall take appropriate measures to ensure that the requirements of ADN have been complied with.".

1.4.3 Add a new section 1.4.3.8 to read as follows:

"**1.4.3.8** ***Reception facility operator***

1.4.3.8.1 In the context of 1.4.1, the reception facility operator shall in particular:

(a) Complete his section of the checklist referred to in 7.2.3.7.2.2 prior to the degassing of empty or unloaded cargo tanks and piping for loading and unloading of a tank vessel;

(b) Ascertain that, when prescribed in 7.2.3.7.2.3, there is a flame arrester in the piping of the reception facility which is connected to the degassing vessel, to protect the vessel against detonations and passage of flames from the side of the reception facility.".

Chapter 1.6

1.6.1.1 Replace "30 June 2017" by "30 June 2019". Replace "31 December 2016" by "31 December 2018".

1.6.1.25, 1.6.1.39, 1.6.1.40 and 1.6.1.42 Delete and insert "*(Deleted)*".

1.6.1.43 Replace "240, 385 and 669" by "388 and 669". Replace "the requirement of 2.2.9.1.7" by "the provisions of 2.2.9.1.7".

1.6.1 Add the following new transitional measure:

"1.6.1.44 Undertakings which participate in the carriage of dangerous goods only as consignors and which did not have to appoint a safety adviser on the basis of the provisions applicable until 31 December 2018 shall, by derogation from the provisions of 1.8.3.1 applicable from 1 January 2019, appoint a safety adviser no later than 31 December 2022.".

"1.6.1.45 Contracting Parties may, until 31 December 2020, continue to issue training certificates for dangerous goods safety advisers conforming to the model applicable until 31 December 2018, instead of those conforming to the requirements of 1.8.3.18 applicable from 1 January 2019. Such certificates may continue in use to the end of their five-year validity.".

"1.6.1.46 The carriage of machinery or equipment not specified in this annex and which happen to contain dangerous goods in their internal or operational equipment and which are therefore assigned to UN Nos. 3363, 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547 or 3548, which was exempted from the provisions of ADN according to 1.1.3.1 (b) applicable until 31 December 2018, may continue to be exempted from the provisions of ADN until 31 December 2022 provided that measures have been taken to prevent any leakage of contents in normal conditions of carriage.".

1.6.7.2.1.1 Amend the transitional provision for 9.1.0.32.2 to read as follows:

9.1.0.32.2	Open ends of the air pipes not less than 0.50 m above the open deck	N.R.M. Renewal of the certificate of approval after 31 December 2018

1.6.7.2.1.1 Add the following new transitional provisions:

Paragraphs	*Subject*	*Time limit and comments*
7.1.2.19.1	Vessels necessary to provide propulsion	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
	Adaptation to the new requirements in 9.1.0.12.4, 9.1.0.40.2, 9.1.0.51 and 9.1.0.52	Until that date, the following requirements apply to vessels in service: In a pushed convoy or a side-by-side formation, where at least one vessel is required to be in possession of a certificate of approval for the carriage of dangerous goods, all vessels of the convoy or side-by-side formation shall be provided with an appropriate certificate of approval. Vessels not carrying dangerous goods shall comply with the requirements of the following sections, subsections and paragraphs: 1.16.1.1, 1.16.1.2, 1.16.1.3, 7.1.2.5, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 9.1.0.0, 9.1.0.12.3, 9.1.0.12.5, 9.1.0.17.2, 9.1.0.17.3, 9.1.0.31, 9.1.0.32, 9.1.0.34, 9.1.0.41, 9.1.0.52.7, 9.1.0.56, 9.1.0.71 and 9.1.0.74.
7.1.3.41	Smoking	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
7.1.3.51.1	Non-electrical installations and equipment	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
7.1.3.51.5	Disconnection of installations and equipment marked in red	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
7.1.3.51.5	Installations and equipment generating surface temperatures of above 200 °C	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
7.1.4.53	Lighting appliances in explosion hazardous areas of zone 2	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2022
8.1.2.2 (e) – (h)	Documents which must be carried on board	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
8.6.1.1 8.6.1.2	Changes to certificate of approval	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2018
9.1.0.12.3	Ventilation of accommodation and wheelhouse	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.12.3	Equipment in the accommodation, wheelhouse and service spaces where surface temperatures can be higher than those mentioned under 9.1.0.51 or where electrical installations and equipment which do not meet the requirements of 9.1.0.52.1 are used	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034

Paragraphs	*Subject*	*Time limit and comments*
9.1.0.12.4	Ventilation inlets	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.12.5	Ventilators used in the protected area and hold ventilators which are arranged in the air flow: Temperature class and explosion group	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.51	Temperature of outer parts of engines and of their air inlets and exhaust ducts	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.52.1	Electrical installations in operation during a stay in the immediate vicinity of or within an onshore assigned zone	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.52.1	Electrical installations, equipment and appliances located outside the protected area	N.R M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the following requirements are applicable on board vessels in service: It shall be possible to isolate the electrical equipment in the protected area by means of centrally located switches except where: • In the holds it is of a certified safe type corresponding at least to temperature class T4 and explosion group II B; and • In the protected area on the deck it is of the limited explosion risk type. The corresponding electrical circuits shall have control lamps to indicate whether or not the circuits are live. The switches shall be protected against unintended unauthorized operation. The sockets used in this area shall be designed so as to prevent connection or disconnection except when they are not live. Submerged pumps installed or used in the holds shall be of the certified safe type at least for temperature class T4 and explosion group II B.
9.1.0.52.2	Installations and equipment marked in red	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.1.0.52.5	Failure of the power supply for the safety and control equipment	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.1.0.53.5	Movable electric cables (sheathed, type H 07 RN-F)	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the following provisions apply on board vessels in service: Until that date, movable electric cables (sheathed, type H 07 RN-F) must comply with IEC 60245-4:1994

Paragraphs	*Subject*	*Time limit and comments*
9.1.0.53.6	Non-electrical installations and equipment within the protected area	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034

1.6.7.2.2.2 Amend the following entries in the table to read as follows:

Paragraphs	*Subject*	*Time limit and comments*
1.2.1	Flame arrester Test according to ISO 16852:2016 or EN ISO 16852:2016	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the following requirements are applicable on board vessels in service: Flame arresters shall be: - Tested according to ISO 16852:2010 or EN ISO 16852:2010 if they have been replaced since 1 January 2015 or are on board vessels built or modified since 1 January 2015; - Tested according to EN 12874:2001 if they have been replaced since 1 January 2001 or are on board vessels built or modified since 1 January 2001; - Of a type approved by the competent authority for the use prescribed if they were replaced before 1 January 2001 or are on board vessels built or modified before 1 January 2001.
1.2.1	High velocity vent valve Test according to ISO 16852:2016 or EN ISO 16852:2016/Proof of conformity with applicable requirements	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the following requirements are applicable on board vessels in service: High velocity vent valves shall be - Tested according to ISO 16852:2010 or EN ISO 16852:2010, including the manufacturer's confirmation in line with Directive 94/9/EC or equivalent, if they have been replaced since 1 January 2015 or are on board vessels built or modified since 1 January 2015. - Tested according to EN 12874:2001, including the manufacturer's confirmation in line with Directive 94/9/EC or equivalent, if they have been replaced since 1 January 2001 or are on board vessels built or modified since 1 January 2001. - Of a type approved by the competent authority for the use prescribed if they were replaced before 1 January 2001 or are on board vessels built or modified before 1 January 2001.
7.2.2.19.3	Vessels used for propulsion Adaptation to new provisions Provisions of 9.3.3.12.4, 9.3.3.51 and 9.3.3.52.1 to 9.3.3.52.8	N.R.M. from 1 January 2019 Renewal of certificate of approval after 31 December 2034

Paragraphs	*Subject*	*Time limit and comments*
9.3.1.10.3 9.3.2.10.3 9.3.3.10.3	Protection wall	N.R.M. from 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.1.12.6 9.3.2.12.6 9.3.3.12.6	Distance between ventilation openings of accommodation and service spaces and the cargo area	N.R.M. from 1 January 2003 Renewal of certificate of approval after 31 December 2034
9.3.1.12.6 9.3.2.12.6 9.3.3.12.6	Permanently installed devices according to 9.3.x.40.2.2 (c)	N.R.M. from 1 January 2003 Renewal of certificate of approval after 31 December 2018

1.6.7.2.2.2 Renumber the transitional provision for "9.3.1.10.2, 9.3.2.10.2, 9.3.3.10.2" as "9.3.1.10.4, 9.3.2.10.4, 9.3.3.10.4". Remainder unchanged.

1.6.7.2.2.2 Renumber the transitional provision for "9.3.1.22.3, 9.3.2.22.4 (b), 9.3.3.22.4 (b)" as "9.3.1.22.3, 9.3.2.22.4 (a), 9.3.3.22.4 (a)" and amend the column "Subject" to read: "Position of exhaust outlets of pressure relief valves/high velocity vent valves above the deck". Remainder unchanged.

1.6.7.2.2.2 Renumber the transitional provision for "9.3.1.31.4, 9.3.2.31.4, 9.3.3.31.4" as "9.3.1.51 (b), 9.3.2.51 (b), 9.3.3.51 (b)" and amend the column "Subject" to read: "Surface temperature of outer parts of engines and of their air inlets and exhaust ducts".

1.6.7.2.2.2 Delete the transitional provision for "9.3.1.32.2, 9.3.2. 32.2, 9.3.3.32.2".

1.6.7.2.2.2 Renumber the transitional provision for "9.3.1.51.2, 9.3.2.51.2, 9.3.3.51.2" as "9.3.1.52.4, 9.3.2.52.4, 9.3.3.52.4". Remainder unchanged.

1.6.7.2.2.2 Delete the transitional provision for "9.3.1.51.3, 9.3.2.51.3, 9.3.3.51.3".

1.6.7.2.2.2 Delete the transitional provision for "9.3.1.52.1 (e), 9.3.3.52.1 (e)".

1.6.7.2.2.2 Delete the transitional provision for "9.3.1.52.3 (a), 9.3.1.52.3 (b), 9.3.3.52.3 (a), 9.3.3.52.3 (b)".

1.6.7.2.2.2 Delete the transitional provision for "9.3.1.52.3 (b), 9.3.2.52.3 (b), 9.3.3.52.3 (b), in conjunction with 3 (a)".

1.6.7.2.2.2 Renumber the transitional provision for "9.3.1.52.4, 9.3.2.52.4, 9.3.3.52.4 Last sentence" as "9.3.1.52.3, 9.3.2.52.3, 9.3.3.52.3 Last sentence". Remainder unchanged.

1.6.7.2.2.2 Renumber the transitional provision for "9.3.1.56.1, 9.3.3.56.1" as "9.3.1.53.2, 9.3.3.53.2" and amend the column "Subject" to read: "Metallic sheaths for all electric cables in the cargo area". Remainder unchanged.

1.6.7.2.2.2 Renumber the transitional provision for "9.3.2.22.4 (b), 9.3.3.22.4 (b)" as "9.3.2.22.4 (a), 9.3.3.22.4 (e)" and amend the column "Subject" to read: "Set pressure of relief valve/high-velocity vent valve".

1.6.7.2.2.2 Delete the transitional provision for "9.3.3.12.7".

1.6.7.2.2.2 Renumber the transitional provision for "9.3.3.52.1 (b), (c), (d) and (e)" as "9.3.3.52.2" and amend the column "Subject" to read: "Electrical installations/echo sounding devices".

1.6.7.2.2.2 Renumber the transitional provision for "9.3.3.52.2" as "9.3.3.52.10". Remainder unchanged.

1.6.7.2.2.2 Delete the transitional provision for "9.3.3.52.3 (a), 9.3.3.52.3 (b)".

1.6.7.2.2.2 Delete the transitional provision for "9.3.3.52.4".

1.6.7.2.2.2 Renumber the transitional provision for "9.3.3.52.5" as "9.3.3.52.9". Remainder unchanged.

1.6.7.2.2.2 Renumber the transitional provision for "9.3.3.52.5" as "9.3.3.52.6". Remainder unchanged.

1.6.7.2.2.2 Renumber the transitional provision for "9.3.3.56.1" as "9.3.3.53.2" and amend the column "Subject" to read: "Metallic sheaths for all electric cables in the cargo area". Remainder unchanged.

1.6.7.2.2.2 Add the following new transitional provisions:

Paragraphs	*Subject*	*Time limit and comments*
1.2.1	Cargo area Spatial extent above the deck	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the following requirements are applicable on board vessels in service: The spatial extent corresponds to a rectangular pyramidal frustum with the following dimensions: Floor area: from board to board and from outer cofferdam bulkhead to outer cofferdam bulkhead Angle of slope of the short sides: 45° Angle of slope of the long sides: 90° Height: 3.00 m Spatial extent of zone 1 corresponds to the cargo area above the deck
1.2.1	Flame arrester Proof of conformity with applicable requirements	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
1.2.1	Gas detection system Test according to IEC 60079-29-1:2016 and EN 50271:2010	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2024
1.2.1	Gas detector Test according to IEC 60079-29-1:2011	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020

Paragraphs	*Subject*	*Time limit and comments*
1.2.1	Sampling opening Deflagration safety Test according to ISO 16852:2016 or EN ISO 16852:2016/Proof of conformity with applicable requirements	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 The deflagration safety of the sampling opening shall be: - Tested according to ISO 16852:2010 or EN ISO 16852:2010, including the manufacturer's confirmation under Directive 94/9/EC or equivalent, if the sampling opening has been replaced since 1 January 2015 or is on board a vessel built or modified since 1 January 2015. - Tested according to EN 12874:2001, including the manufacturer's confirmation under Directive 94/9/EC or equivalent, if the sampling opening has been replaced since 1 January 2001 or is on board a vessel built or modified since 1 January 2001. - Of a type approved by the competent authority for the use prescribed if the sampling opening was replaced before 1 January 2001 or is on board a vessel built or modified before 1 January 2001.
1.2.1	Oxygen measuring system Test according to EN 50104:2010	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020
1.2.1	Oxygen meter Test according to EN 50104:2010	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020
1.2.1	Device for the safe depressurization of cargo tanks Deflagration safety Test according to ISO 16852:2016 or EN ISO 16852:2016/Proof of conformity with applicable requirements	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 The deflagration safety shall be tested according to EN 12874:2001 including the manufacturer's confirmation under Directive 94/9/EC on board vessels built or modified from 1 January 2001 or if the safe pressure-relief device for the cargo tanks has been replaced since 1 January 2001. In other cases, they shall be of a type approved by the competent authority for the use prescribed.

Paragraphs	*Subject*	*Time limit and comments*
1.2.1	Classification in zones	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
	Zone 1	
	Spatial extent	Until that date, the following requirements are applicable on board vessels in service: the spatial extent of zone 1 corresponds to a rectangular pyramidal frustrum with the following dimensions:
		Floor area: from board to board and from outer cofferdam bulkhead to outer cofferdam bulkhead
		Angle of slope of the short sides: 45°
		Angle of slope of the long sides: 90°
		Height: 3.00 m
	Zone 2	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
	Spatial extent:	
7.2.2.6	Calibration of gas detection system for n-Hexane	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020
7.2.2.19.4	Vessels of the formation for which explosion protection is required	N.R.M. from 1 January 2019
		Renewal of the certificate of approval after 31 December 2034
		Until that date, the following requirements apply to vessels in service:
		Vessels moving a pushed convoy or a side-by-side formation shall comply with the requirements of the following sections, subsections and paragraphs: 1.16.1.1, 1.16.1.2, 1.16.1.3, 7.2.2.5, 8.1.4, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 9.3.3.0.1, 9.3.3.0.3 (d), 9.3.3.0.5, 9.3.3.10.1, 9.3.3.10.2, 9.3.3.12.4 (a) except the wheelhouse, 9.3.3.12.4 (b) except for the t90 response time, 9.3.3.12.4 (c), 9.3.3.12.6, 9.3.3.16, 9.3.3.17.1 to 9.3.3.17.4, 9.3.3.31.1 to 9.3.3.31.5, 9.3.3.32.2, 9.3.3.34.1, 9.3.3.34.2, 9.3.3.40.1 (although a single fire or ballast pump is sufficient), 9.3.3.40.2, 9.3.3.41, 9.3.3.50.1 (c), 9.3.3.50.2, 9.3.3.51, 9.3.3.52.6, 9.3.3.52.7, 9.3.3.52.8, 9.3.3.56.5, 9.3.3.71 and 9.3.3.74, when at least one vessel of the convoy or side-by-side formation is carrying dangerous goods.
		Vessels moving only type N open tank vessels do not have to meet the requirements of paragraphs 9.3.3.10.1, 9.3.3.10.2 and 9.3.3.12.6. These derogations shall be specified in the certificate of approval or the provisional certificate of approval as follows: "Permitted derogations": "Derogation from 9.3.3.10.1, 9.3.3.10.2 and 9.3.3.12.6; the vessel may only move type N open tank vessels.".
7.2.3.41	Smoking	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020

Paragraphs	*Subject*	*Time limit and comments*
7.2.3.51.4	Disconnection of non-electrical installations and equipment marked in red	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
7.2.3.51.5	Surface temperature where T4, T5 or T6 are required	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
8.1.2.3 (r), (s), (t), (v)	Documents which must be carried on board	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020 Until that date, in addition to the documents required in accordance with 1.1.4.6, the following documents are required: (a) A plan indicating the boundaries of the cargo area and the location of the electrical equipment installed in that area; (b) A list of the machinery, appliances or other electrical equipment referred to in (a) above, including the following particulars: Machinery or appliance, location, type of protection, type of explosion protection, testing body and approval number; (c) A list of or general plan indicating the electrical equipment located outside the cargo area which may be operated during loading, unloading or gas-freeing. The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.
8.1.2.3 (u)	Documents which must be carried on board Plan with classification of zones	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
8.1.6.3	Verification of the oxygen measuring system	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020
8.1.7.2	Installations, equipment and self-contained protection systems, testing of installations, equipment and self-contained protection systems as well as compliance with the documents referred to in 8.1.2.3 (r) to (v) in respect of the situation on board	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020
8.1.7.2	Marking of installations and equipment to be used in explosion hazardous areas as well as of self-contained protection systems	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024

Paragraphs	*Subject*	*Time limit and comments*
8.6.1.3 8.6.1.4	Change to certificate of approval	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2018
9.3.1.8.4 9.3.2.8.4 9.3.3.8.4	Compliance with the documents in 8.1.3.2 (r) to (v)	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2018
9.3.1.10.1 9.3.2.10.1 9.3.3.10.1	Penetration of gases and liquids into the wheelhouse Windows that can be opened	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.1.10.2 9.3.2.10.2 9.3.3.10.2	Height of protective coaming	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2020
9.3.3.11.2 (d)	Side struts between the hull and the cargo tanks	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2044
9.3.1.12.4 9.3.2.12.4 9.3.3.12.4	Ventilation of the wheelhouse	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.1.12.4 9.3.2.12.4 9.3.3.12.4	Equipment in the accommodation, wheelhouse and service spaces where surface temperatures can be higher than those mentioned in 9.3.x.51 (a)	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.12.4 9.3.2.12.4 9.3.3.12.4	Equipment in the wheelhouse where surface temperatures can be higher than those mentioned in 9.3.x.51 (a) or involving the use of electrical equipment which does not meet the requirements of 9.3.x.52.1	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034

Paragraphs	*Subject*	*Time limit and comments*
9.3.1.12.4 9.3.3.12.4	Electrical installations and equipment used during loading, unloading, gas-freeing and when in the immediate vicinity of or within an onshore assigned zone	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, on board type G and type N vessels whose keels were laid before 1 January 1977, all electrical equipment except the lighting installations in accommodation, radio telephone installations in the accommodation and the wheelhouse and combustion engine control appliances, shall meet the following requirements: Generators, engine, etc.: IP 13 protection mode Switchboards, switches near entrances to accommodation, etc.: IP23 protection mode Appliances, etc.: IP 55 protection mode
9.3.1.12.4 9.3.2.12.4 9.3.3.12.4	Non-electrical installations and equipment used during loading, unloading, degassing and when in the immediate vicinity of or within an onshore assigned zone	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.12.4 (b) 9.3.2.12.4 (b) 9.3.3.12.4 (b)	Gas detection system: T90-time	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.12.4 9.3.2.12.4 9.3.3.12.4	Alarms outstanding	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.1.12.6 9.3.2.12.6 9.3.3.12.6	Distance between ventilation inlets in the wheelhouse and the cargo area	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.17.6 9.3.2.17.6 9.3.3.17.6	Distance between the ventilation inlets in the pump-room and the wheelhouse	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.17.6 9.3.2.17.6 9.3.3.17.6	Oxygen measuring system Minimum value for the alarm	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2020
9.3.1.17.6 9.3.2.17.6 9.3.3.17.6	Alarms outstanding	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024

Paragraphs	*Subject*	*Time limit and comments*
9.3.1.21.7 9.3.2.21.7 9.3.3.21.7	Alarms outstanding	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.2.20.4 9.3.3.20.4	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2024
9.3.2.21.1 (g) 9.3.3.21.1 (g)	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.2.22.4 (e) 9.3.3.22.4 (d)	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.2.26.2 9.3.3.26.2 (b)	Explosion group/subgroup	N.R.M. From 1 January 2019 Renewal of certificate of approval after 31 December 2024
9.3.1.51 (a) 9.3.2.51 (a) 9.3.3.51 (a)	The surface temperature of non-electrical installations and equipment shall not exceed 200 °C	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.52.1 9.3.2.52.1 9.3.3.52.1	Electrical installations and equipment of the limited explosion risk type	N.R.M. Renewal of certificate of approval after 31 December 2034 Until that date, the following documents are required for electrical equipment used during loading, unloading and gas-freeing of vessels in service whose keels were laid after 1 January 1995: 9.3.1.52.3, 9.3.2.52.3 and 9.3.3.52.3 of the version of ADN in force until 31 December 2018
9.3.1.52.1 9.3.3.52.1	Electrical installations and equipment of the limited explosion risk type	N.R.M. Renewal of the certificate of approval after 31 December 2034 Until that date, on board vessels whose keels were laid before 1 January 1977, all electrical equipment except the lighting installations in the accommodation, radio telephone installations in the accommodation and the wheelhouse and combustion engine control appliances in use during loading, unloading and gas-freeing shall meet the following requirements: Generators, engines, switchboards, lighting, etc.: IP 13 protection mode Appliances, etc.: IP 55 protection mode
9.3.3.52.1	Electrical installations in operation during a stay in the immediate vicinity of or within an onshore assigned zone	N.R.M. from 1 January 2019 for open Type N vessels Renewal of certificate of approval after 31 December 2034
9.3.3.52.3	Electrical installations and equipment: marking in red	N.R.M. from 1 January 2019 for open Type N vessels Renewal of certificate of approval after 31 December 2034

Paragraphs	*Subject*	*Time limit and comments*
9.3.1.53.1 9.3.2.53.1 9.3.3.53.1	Type and location of electrical installations and equipment intended to be used in explosion hazardous areas Zone 0, Zone 1	N.R.M. from 1 January 2019 Renewal of certificate of approval after 31 December 2034 Until that date, the following requirements are applicable: (a) In cargo tanks and piping for loading and unloading, only measuring, regulation and alarm devices of the EEx (ia) type of protection may be installed. (b) Electrical equipment on deck in the cargo area and the measuring, regulation and alarm apparatus, motors driving essential equipment such as ballast pumps in the cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck in the cargo area shall be checked and approved by the competent authority with respect to the safety of operation in an explosive atmosphere, for example, intrinsically safe apparatus, flameproof enclosure apparatus, apparatus protected by pressurization, powder filling apparatus, apparatus protected by encapsulation and increased safety apparatus. (c) In the cofferdams, double-hull spaces, double bottoms, hold spaces and service spaces below deck in the cargo area, the lighting appliances must have the "flame-proof enclosure" or "apparatus protected by pressurization" type of protection. (d) The control and protective equipment of the equipment referred to in (a), (b) and (c) above shall be located outside the cargo area if they are not intrinsically safe. For the selection of electrical equipment, the explosion groups and temperature classes assigned to the substances carried in the list of substances shall be taken into consideration (see columns (15) and (16) of Table C of Chapter 3.2). Until that date, the following requirements apply on board vessels in service whose keels were laid after 31 December 1977: Until that date, the following conditions shall be met during loading, unloading and gas freeing on board vessels having non-gastight wheelhouse openings (e.g. doors, windows, etc.) in the cargo area: (a) All electrical equipment to be used in the wheelhouse shall be of a limited explosion-risk type, i.e., it shall be so designed that there is no sparking and the temperature of its outer surface does not rise above 200 °C during normal operation, or it shall be of a type protected against water jets and designed in such a way that its surface temperature may not exceed 200 °C during normal operation. (b) Electrical equipment which does not meet the requirements of (a) above shall be marked in red and it shall be possible to switch it off by means of a central switch.

Paragraphs	*Subject*	*Time limit and comments*
9.3.1.53.1 9.3.2.53.1 9.3.3.53.1	Type and location of electrical installations and equipment intended to be used in explosion hazardous areas Zone 2	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.53.1 9.3.2.53.1 9.3.3.53.1	Temperature class and explosion group of non-electrical installations and equipment	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.53.1 9.3.2.53.1 9.3.3.53.1	Temperature class and explosion group of electrical installations and equipment	N.R.M. From 1 January 2019 Renewal of the certificate of approval after 31 December 2034
9.3.1.53.5 9.3.2.53.5 9.3.3.53.5	Movable electric cables (sheathed, type H 07 RN-F)	N.R.M. from 1 January 2019 Renewal of the certificate of approval after 31 December 2034 Until that date, the following provisions apply on board vessels in service: Until that date, movable electric cables (sheathed, type H 07 RN-F) must comply with IEC 60245-4:1994
9.3.1.60 9.3.2.60 9.3.3.60	A spring-loaded non-return valve shall be fitted. The water shall meet the quality of drinking water on board.	N.R.M. Renewal of the certificate of approval after 31 December 2018

1.6.7.4.1 Delete the first sentence.

1.6.8 Renumber existing text as 1.6.8.1. Add a new 1.6.8.2 to read as follows:

"1.6.8.2 Instead of issuing certificates of special knowledge of ADN in accordance with 8.2.2.8.2 and 8.6.2, Contracting Parties may, until 31 December 2021, issue certificates according to the model applicable until 31 December 2018. Such certificates shall be valid until the expiry of their validity of five years.".

Chapter 1.7

1.7.1.1 The amendment does not apply to the English text.

1.7.1.2 The amendment does not apply to the English text.

1.7.5 In the first sentence, replace "subsidiary risk" by "subsidiary hazard".

Chapter 1.8

1.8.3.1 Before "carriage", insert "consigning,". At the end, add a Note to read as follows: "***NOTE:*** *This obligation does not apply to reception facility operators.*".

1.8.3.2 (a) In subparagraphs (ii) and (iii), replace "smaller than those" by "not exceeding those".

1.8.3.3 In the ninth indent of the second paragraph, before "carriage", insert "consigning,".

1.8.3.18 In the eighth entry of the certificate ("Valid until ..."), before "packing", insert "consigning,".

1.8.3 Insert the following new sub-section 1.8.3.19:

"1.8.3.19 *Extension of the certificate*

Where an adviser extends the scope of his certificate during its period of validity by meeting the requirements of 1.8.3.16.2, the period of validity of a new certificate shall remain that of the previous certificate.".

1.8.5.1 After ", carriage or unloading of dangerous goods" insert ", or during degassing of tank vessels". Replace "the loader, filler, carrier or consignee," by "the loader, filler, carrier, consignee or reception facility operator,".

Chapter 1.10

1.10.3 After the heading, insert the following note:

"***NOTE:*** *In addition to the security provisions of ADN, competent authorities may implement further security provisions for reasons other than safety during carriage (see also Article 4, paragraph 1 of the Agreement). In order not to impede international and multimodal carriage by different explosives security marks, it is recommended that such marks be formatted consistent with an internationally harmonized standard (e.g. European Union Commission Directive 2008/43/EC).*".

Table 1.10.3.1.2 In the column for "Substance or article", amend the text of the first line for Class 2 to read as follows: "Flammable, non-toxic gases (classification codes including only letters F or FC)".

1.10.3.1.5 Replace "subsidiary risk" by "subsidiary hazard".

Chapter 2.1

2.1.2.1 In the last sentence, replace "subsidiary risk(s)" by "subsidiary hazard(s)" and replace "those risks" by "those hazards".

2.1.2.5 In the second and in the third sentence, replace "subsidiary risk" by "subsidiary hazard".

2.1.2.8 The amendment to the first indent does not apply to the English text.

2.1.2.8 In the second indent, replace "subsidiary risk(s)" by "subsidiary hazard(s)".

2.1.3.3 In the last paragraph, replace "subsidiary risks" by "subsidiary hazards".

2.1.3.5.5 In footnote 2, after "(Official Journal of the European Communities No. L 226 of 6 September 2000, page 3)" and after "(Official Journal of the European Union No. L312 of 22 November 2008, pages 3-30)", insert ", as amended".

2.1.3.7 In the first sentence, replace "subsidiary risk" by "subsidiary hazard".

2.1.3.7 At the end, add: "For solid ammonium nitrate based fertilizers, see also 2.2.51.2.2, thirteenth and fourteenth indent and Manual of Tests and Criteria, Part III, Section 39.".

2.1.4 Add the following new sub-section 2.1.4.3:

"**2.1.4.3** ***Samples of energetic materials for testing purposes***

2.1.4.3.1 Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.3 in Appendix 6 (Screening Procedures) of the Manual of Tests and Criteria may

be carried under UN No. 3224 (self-reactive solid type C) or UN No. 3223 (self-reactive liquid type C), as applicable, of Class 4.1 provided that:

(a) The samples do not contain any:

- Known explosives;
- Substances showing explosive effects in testing;
- Compounds designed with the view of producing a practical explosive or pyrotechnic effect; or
- Components consisting of synthetic precursors of intentional explosives;

(b) For mixtures, complexes or salts of inorganic oxidizing substances of Class 5.1 with organic material(s), the concentration of the inorganic oxidizing substance is:

- Less than 15%, by mass, if assigned to packing group I (high hazard) or II (medium hazard); or
- Less than 30%, by mass, if assigned to packing group III (low hazard);

(c) Available data do not allow a more precise classification;

(d) The sample is not packed together with other goods; and

(e) The sample is packed in accordance with packing instruction P520 and special packing provisions PP94 or PP95 of 4.1.4.1 of ADR, as applicable.".

2.1.5 Add the following new section 2.1.5 and renumber existing 2.1.5 as 2.1.6:

"**2.1.5 Classification of articles as articles containing dangerous goods, n.o.s.**

2.1.5.1 Articles containing dangerous goods may be classified as otherwise provided by ADN under the proper shipping name for the dangerous goods they contain or in accordance with this section.

For the purposes of this section "article" means machinery, apparatus or other devices containing one or more dangerous goods (or residues thereof) that are an integral element of the article, necessary for its functioning and that cannot be removed for the purpose of carriage.

An inner packaging shall not be an article.

2.1.5.2 Such articles may in addition contain batteries. Lithium batteries that are integral to the article shall be of a type proven to meet the testing requirements of the Manual of Tests and Criteria, part III, sub-section 38.3, except when otherwise specified by ADN (e.g. for pre-production prototype articles containing lithium batteries or for a small production run, consisting of not more than 100 such articles).

2.1.5.3 This section does not apply to articles for which a more specific proper shipping name already exists in Table A of Chapter 3.2.

2.1.5.4 This section does not apply to dangerous goods of Class 1, Class 6.2, Class 7 or radioactive material contained in articles.

2.1.5.5 Articles containing dangerous goods shall be assigned to the appropriate Class determined by the hazards present using, where applicable, the table of precedence of hazard in 2.1.3.10 for each of the dangerous goods contained in the article. If dangerous goods classified as Class 9 are contained within the article, all other dangerous goods present in the article shall be considered to present a higher hazard.

2.1.5.6 Subsidiary hazards shall be representative of the primary hazards posed by the other dangerous goods contained within the article. When only one item of dangerous goods

is present in the article, the subsidiary hazard(s), if any, shall be the subsidiary hazard(s) identified by the subsidiary hazard label(s) in column (5) of Table A of Chapter 3.2. If the article contains more than one item of dangerous goods and these could react dangerously with one another during carriage, each of the dangerous goods shall be enclosed separately (see 4.1.1.6 of ADR).".

Chapter 2.2

2.2.1.1.1 (c) Replace "practical effect by explosion or a pyrotechnic effect" by "practical explosive or pyrotechnic effect".

2.2.1.1.5 For "Division 1.4", in the first sentence, replace "risk" by "hazard". For "Division 1.6", in the Note, replace "risk" by "hazard".

2.2.1.1.6 For "Compatibility group L", replace "risk" by "hazard".

2.2.1.1.7.1 (a) Replace "giving a positive result when tested in one of the HSL Flash composition tests in Appendix 7 of the Manual of Tests and Criteria" by "containing flash composition (see Note 2 of 2.2.1.1.7.5)".

2.2.1.1.7.5 Amend Note 2 to read as follows:

"***NOTE 2:*** *"Flash composition" in this table refers to pyrotechnic substances in powder form or as pyrotechnic units as presented in the fireworks that are used in waterfalls, or to produce an aural effect or used as a bursting charge, or propellant charge unless:*

(a) The time taken for the pressure rise in the HSL Flash Composition Test in Appendix 7 of the Manual of Tests and Criteria is demonstrated to be more than 6 ms for 0.5 g of pyrotechnic substance; or

(b) The pyrotechnic substance gives a negative "-" result in the US Flash Composition Test in Appendix 7 of the Manual of Tests and Criteria.".

2.2.1.1.7.5 (table) The first amendment does not apply to the English text.

2.2.1.1.7.5 (table) Amend the entry for "Waterfall" as follows:

For classification 1.1G, amend the entry under "Specification" to read: "Containing flash composition regardless of the results of Test Series 6 (see 2.2.1.1.7.1 (a))".

For classification 1.3G, amend the entry under "Specification" to read: "Not containing flash composition".

2.2.1.1.8.2 In Note 2, at the end, replace "risk" by "hazard".

2.2.1.4 The amendments do not apply to the English text.

2.2.2.1.5 Under "Toxic gases", in the Note, replace "risk" by "hazard". Under "Corrosive gases", in the first and second sentences, replace "risk" by "hazard".

2.2.2.3 (table)Under "Other articles containing gas under pressure", for "6A", add "3538 ARTICLES CONTAINING NON-FLAMMABLE, NON TOXIC GAS, N.O.S.".

2.2.2.3 (table)Under "Other articles containing gas under pressure", for "6F", add "3537 ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.".

2.2.2.3 (table)Under "Other articles containing gas under pressure", add a new row as follows:

6T	3539	ARTICLES CONTAINING TOXIC GAS, N.O.S.

2.2.3.1.2 For "Subdivision F", replace "risk" by "hazard".

2.2.3.1.3 In the last paragraph, replace "risk(s)" by "hazard(s)" (twice).

2.2.3.1.6 Replace "risk" by "hazard".

2.2.3.3 For "F", replace "risk" by "hazard". For "FT2", in the Note after the entries, replace "risks" by "hazards".

2.2.3.3, List of collective entries In "Flammable liquids and articles containing such substances", for "F3", add:

"3540 ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.".

2.2.41.1.2 In subdivision "F", replace "risk" by "hazard". In subdivision "D", replace "risk" by "hazard".

2.2.41.1.7 Replace "risk" by "hazard".

2.2.41.1.12 At the end of the first paragraph, replace "risks" by "hazards".

2.2.41.1.17 Amend to read as follows:

"2.2.41.1.17 Self-reactive substances with an SADT not greater than 55 °C shall be subject to temperature control during carriage. See 7.1.7.".

2.2.41.1.21 At the end, add the following: "See 7.1.7.".

2.2.41.1.21 Add the following Note at the end:

"***NOTE:*** *Substances meeting the criteria of polymerizing substances and also for inclusion in Classes 1 to 8 are subject to the requirements of special provision 386 of Chapter 3.3.*".

2.2.41.3, List of collective entries In "Flammable solids" and in "Solid desensitized explosives", replace "without subsidiary risk" by "without subsidiary hazard".

2.2.41.3, List of collective entries In "Flammable solids", for "F4", add:

"3541 ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.".

2.2.41.4 At the end of the first paragraph, replace "4.2.5.2" by "4.2.5.2.6" and add a new sentence to read as follows: "The formulations listed in packing instruction IBC520 of 4.1.4.2 of ADR and in portable tank instruction T23 of 4.2.5.2.6 of ADR may also be carried packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1 of ADR, with the same control and emergency temperatures, if applicable.".

2.2.41.4 In the table, insert a new entry to read as follows:

SELF-REACTIVE SUBSTANCE	*Concentration (%)*	*Packing method*	*Control temperature (°C)*	*Emergency temperature (°C)*	*UN generic entry*	*Remarks*
Phosphorothioic acid, O-[(cyanophenyl methylene) azanyl] O,O-diethyl ester	82-91 (Z isomer)	OP8			3227	(10)

2.2.41.4 After the table, in remarks (1), (4), (6), replace "2.2.41.1.17" by "7.1.7.3.1 to 7.1.7.3.6".

2.2.41.4 In remark (2) after the table, replace "risk" by "hazard".

2.2.41.4 After the table, add a new remark (10) to read as follows:

"(10) This entry applies to the technical mixture in n-butanol within the specified concentration limits of the (Z) isomer.".

2.2.42.1.2 Amend the title of subdivision "S" to read "Substances liable to spontaneous combustion, without subsidiary hazard".

2.2.42.1.2 In "S Substances liable to spontaneous combustion, without subsidiary hazard", insert the following new entry: "S6 Articles".

2.2.42.1.5 In Note 3, replace "risks" by "hazards".

2.2.42.1.6 Replace "risk" by "hazard".

2.2.42.3, List of collective entries In "S", replace "risk" by "hazard".

2.2.42.3, List of collective entries In "S Substances liable to spontaneous combustion, without subsidiary hazard", insert the following new entry:

Articles	S6	3542 ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.

2.2.43.1.2 In the title of subdivision "W" replace "without subsidiary risk" by "without subsidiary hazard".

2.2.43.1.5 In the Note, replace "risks" by "hazards".

2.2.43.1.6 Replace "risk" by "hazard".

2.2.43.3, List of collective entries In the "W", replace "risk" by "hazard".

2.2.43.3, List of collective entries In "Substances which, in contact with water, emit flammable gases, without subsidiary hazard", for "articles W3", add the following new entry:

"3543 ARTICLES CONTAINING A SUBSTANCE WHICH IN CONTACT WITH WATER EMITS FLAMMABLE GASES, N.O.S.".

2.2.51.1.2 In the title of subdivision "O" replace "without subsidiary risk" by "without subsidiary hazard".

2.2.51.1.3 and 2.2.51.1.5 Replace "2.2.51.1.9" by "2.2.51.1.10".

2.2.51.1.3 At the end of the second sentence, add "or, for solid ammonium nitrate based fertilizers, Section 39 subject to the restrictions of 2.2.51.2.2, thirteenth indent".

2.2.51.1.4 Replace "risk" by "hazard".

2.2.51.1.5 In the first sentence, after "Section 34.4", insert "or, for solid ammonium nitrate based fertilizers, Section 39,".

2.2.51.1 Under the heading "Classification", insert a new 2.2.51.1.7 to read as follows and renumber subsequent paragraphs accordingly:

"2.2.51.1.7 By exception, solid ammonium nitrate based fertilizers shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, Part III, Section 39.".

2.2.51.2.2 Replace the thirteen indent by the following text:

"– ammonium nitrate based fertilizers with compositions that lead to exit boxes 4, 6, 8, 15, 31, or 33 of the flowchart of paragraph 39.5.1 of the Manual of Tests and Criteria, Part III, Section 39, unless they have been assigned a suitable UN number in Class 1;

– ammonium nitrate based fertilizers with compositions that lead to exit boxes 20, 23 or 39 of the flowchart of paragraph 39.5.1 of the Manual of Tests and Criteria, Part III, Section 39, unless they have been assigned a suitable UN number in Class 1 or, provided that the suitability for carriage has been demonstrated and that this has been approved by the competent authority, in Class 5.1 other than UN No. 2067;".

2.2.51.3, List of collective entries In "O", replace "risk" by "hazard".

2.2.51.3, List of collective entries In "O Oxidizing substances and articles containing such substances, without subsidiary hazard", for "articles O3", add the following new entry:

"3544 ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.".

2.2.52.1.7 At the end of the first paragraph, replace "risks" by "hazards".

2.2.52.1.7, third indent Replace "2.2.52.1.15 to 2.2.52.1.18" by "2.2.52.1.15 and 2.2.52.1.16".

2.2.52.1.7 At the end, replace "2.2.52.1.16" by "7.1.7.3.6".

2.2.52.1.15 to 2.2.52.1.17 Amend as follows:

Delete 2.2.52.1.15 and 2.2.52.1.16.

Renumber 2.2.52.1.17 as 2.2.52.1.15 and add the following new text after the Note: "See 7.1.7.".

2.2.52.1.18 Renumber as 2.2.52.1.16.

2.2.52.3, List of collective entries For P1 and P2, add the following new entry:

"3545 ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.".

2.2.52.4 At the end of the first paragraph, replace "4.2.5.2" by "4.2.5.2.6" and add a new sentence to read as follows: "The formulations listed in packing instruction IBC520 of 4.1.4.2 of ADR and in portable tank instruction T23 of 4.2.5.2.6 of ADR may also be carried packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1 of ADR, with the same control and emergency temperatures, if applicable.".

2.2.52.4 (table) In the header of the last column, replace "risks" by "hazards".

2.2.52.4 (table) Insert the following new entries:

Organic peroxide	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*
DIISOBUTYRYL PEROXIDE	≤ 42 (as a stable dispersion in water)						OP8	- 20	- 10	3119
DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	≤ 42 (as a paste)						OP7	+ 35	+ 40	3116
1-PHENYLETHYL HYDROPEROXIDE	≤ 38			≥ 62			OP8			3109

2.2.52.4 After the table, in remarks 3, 13, 18 and 27, replace "risk" by "hazard".

2.2.61.1.2 In the title of subdivision "T" replace "without subsidiary risk" by "without subsidiary hazard".

2.2.61.1.2 In "Toxic substances without subsidiary hazard" add the following new subdivision:

"T10 Articles".

2.2.61.1.7.2 Replace "(see footnote 6 in 2.2.8.1.4)" by "(see 2.2.8.1.4.5)".

2.2.61.1.11 In the second sentence, replace "risks" by "hazards".

2.2.61.1.11.2 Replace "risks" by "hazards".

2.2.61.1.12 Replace "risk" by "hazard".

2.2.61.3, List of collective entries Replace "risk(s)" by "hazard(s)" in all the headings.

2.2.61.3, List of collective entries In "Toxic substances without subsidiary hazard", add the following new row:

Articles	T10	3546 ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.

2.2.61.3, List of collective entries In "Toxic substances with subsidiary hazard(s)", for TF3, add:

"3535 TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.".

2.2.62.1.3 In the definition of *"Patient specimens"*, replace "human or animal materials," by "those".

2.2.62.1.12.2 Delete and insert "2.2.62.1.12.2 *(Deleted)*".

Amend Section 2.2.8 as follows:

Amend 2.2.8.1(title) to read:

"2.2.8.1 *Definition, general provisions and criteria".*

Delete existing 2.2.8.1.1 and insert the following paragraphs:

"2.2.8.1.1 Corrosive substances are substances which, by chemical action, will cause irreversible damage to the skin, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport. The heading of this class also covers other substances which form a corrosive liquid only in the presence of water, or which produce corrosive vapour or mist in the presence of natural moisture of the air.

2.2.8.1.2 For substances and mixtures that are corrosive to skin, general classification provisions are provided in 2.2.8.1.4. Skin corrosion refers to the production of irreversible damage to the skin, namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.

2.2.8.1.3 Liquids and solids which may become liquid during carriage, which are judged not to be skin corrosive shall still be considered for their potential to cause corrosion to certain metal surfaces in accordance with the criteria in 2.2.8.1.5.3 (c) (ii).

2.2.8.1.4 *General classification provisions*".

Insert existing 2.2.8.1.2 (Class 8 subdivisions) renumbered as 2.2.8.1.4.1.

Delete previous 2.2.8.1.3 to 2.2.8.1.6.

Insert the following paragraphs:

"2.2.8.1.4.2 Substances and mixtures of Class 8 are divided among the three packing groups according to their degree of danger in carriage:

(a) Packing group I: very dangerous substances and mixtures;

(b) Packing group II: substances and mixtures presenting medium danger;

(c) Packing group III: substances and mixtures that present minor danger.

2.2.8.1.4.3 Allocation of substances listed in Table A of Chapter 3.2 to the packing groups in Class 8 has been made on the basis of experience taking into account such additional factors as inhalation risk (see 2.2.8.1.4.5) and reactivity with water (including the formation of dangerous decomposition products).

2.2.8.1.4.4 New substances and mixtures can be assigned to packing groups on the basis of the length of time of contact necessary to produce irreversible damage of intact skin tissue

in accordance with the criteria in 2.2.8.1.5. Alternatively, for mixtures, the criteria in 2.2.8.1.6 can be used.

2.2.8.1.4.5 A substance or mixture meeting the criteria of Class 8 having an inhalation toxicity of dusts and mists (LC_{50}) in the range of packing group I, but toxicity through oral ingestion or dermal contact only in the range of packing group III or less, shall be allocated to Class 8 (see 2.2.61.1.7.2).

2.2.8.1.5 *Packing group assignment for substances and mixtures*

2.2.8.1.5.1 Existing human and animal data including information from single or repeated exposure shall be the first line of evaluation, as they give information directly relevant to effects on the skin.

2.2.8.1.5.2 In assigning the packing group in accordance with 2.2.8.1.4.4, account shall be taken of human experience in instances of accidental exposure. In the absence of human experience the assignment shall be based on data obtained from experiments in accordance with OECD Test Guideline 404[1] or 435[2]. A substance or mixture which is determined not to be corrosive in accordance with OECD Test Guideline 430[3] or 431[4] may be considered not to be corrosive to skin for the purposes of ADN without further testing.

2.2.8.1.5.3 Packing groups are assigned to corrosive substances in accordance with the following criteria (see table 2.2.8.1.5.3):

(a) Packing group I is assigned to substances that cause irreversible damage of intact skin tissue within an observation period up to 60 minutes starting after the exposure time of three minutes or less;

(b) Packing group II is assigned to substances that cause irreversible damage of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than three minutes but not more than 60 minutes;

(c) Packing group III is assigned to substances that:

(i) Cause irreversible damage of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 60 minutes but not more than 4 hours; or

(ii) Are judged not to cause irreversible damage of intact skin tissue but which exhibit a corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55 °C when tested on both materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574 or Unified Numbering System (UNS) G10200 or a similar type or SAE 1020, and for testing aluminium, non-clad, types 7075–T6 or AZ5GU-T6 shall be used. An acceptable test is prescribed in the Manual of Tests and Criteria, Part III, Section 37.

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[1] *OECD Guideline for the testing of chemicals No. 404 "Acute Dermal Irritation/Corrosion" 2015*

[2] *OECD Guideline for the testing of chemicals No. 435 "In Vitro Membrane Barrier Test Method for Skin Corrosion" 2015*

[3] *OECD Guideline for the testing of chemicals No. 430 "In Vitro Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)" 2015*

[4] *OECD Guideline for the testing of chemicals No. 431 "In Vitro Skin Corrosion: Human Skin Model Test" 2015*

NOTE: Where an initial test on either steel or aluminium indicates the substance being tested is corrosive the follow up test on the other metal is not required.

Table 2.2.8.1.5.3: Table summarizing the criteria in 2.2.8.1.5.3

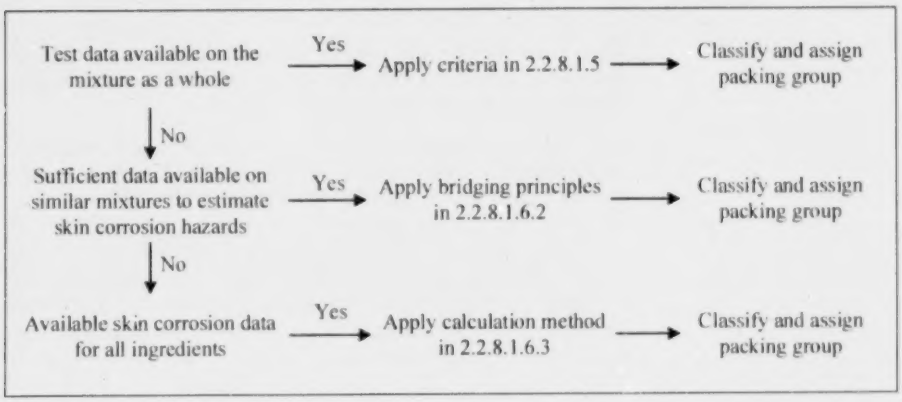
Packing Group	Exposure Time	Observation Period	Effect
I	≤ 3 min	≤ 60 min	Irreversible damage of intact skin
II	> 3 min ≤ 1 h	≤ 14 d	Irreversible damage of intact skin
III	> 1 h ≤ 4 h	≤ 14 d	Irreversible damage of intact skin
III	-	-	Corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55 °C when tested on both materials

2.2.8.1.6 *Alternative packing group assignment methods for mixtures: Step-wise approach*

2.2.8.1.6.1 General provisions

For mixtures it is necessary to obtain or derive information that allows the criteria to be applied to the mixture for the purpose of classification and assignment of packing groups. The approach to classification and assignment of packing groups is tiered, and is dependent upon the amount of information available for the mixture itself, for similar mixtures and/or for its ingredients. The flow chart of Figure 2.2.8.1.6.1 below outlines the process to be followed:

Figure 2.2.8.1.6.1: Step-wise approach to classify and assign packing group of corrosive mixtures


Test data available on the mixture as a whole
Yes
Apply criteria in 2.2.8.1.5
Classify and assign packing group
No
Sufficient data available on similar mixtures to estimate skin corrosion hazards
Yes
Apply bridging principles in 2.2.8.1.6.2
Classify and assign packing group
No
Available skin corrosion data for all ingredients
Yes
Apply calculation method in 2.2.8.1.6.3
Classify and assign packing group

2.2.8.1.6.2 Bridging principles

Where a mixture has not been tested to determine its skin corrosion potential, but there are sufficient data on both the individual ingredients and similar tested mixtures to adequately classify and assign a packing group for the mixture, these data will be used in accordance with the following bridging principles. This ensures that the classification process uses the available data to the greatest extent possible in characterizing the hazards of the mixture.

(a) Dilution: If a tested mixture is diluted with a diluent which does not meet the criteria for Class 8 and does not affect the packing group of other

ingredients, then the new diluted mixture may be assigned to the same packing group as the original tested mixture.

NOTE: *In certain cases, diluting a mixture or substance may lead to an increase in the corrosive properties. If this is the case, this bridging principle cannot be used.*

(b) Batching: The skin corrosion potential of a tested production batch of a mixture can be assumed to be substantially equivalent to that of another untested production batch of the same commercial product when produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the skin corrosion potential of the untested batch has changed. If the latter occurs, a new classification is necessary.

(c) Concentration of mixtures of packing group I: If a tested mixture meeting the criteria for inclusion in packing group I is concentrated, the more concentrated untested mixture may be assigned to packing group I without additional testing.

(d) Interpolation within one packing group: For three mixtures (A, B and C) with identical ingredients, where mixtures A and B have been tested and are in the same skin corrosion packing group, and where untested mixture C has the same Class 8 ingredients as mixtures A and B but has concentrations of Class 8 ingredients intermediate to the concentrations in mixtures A and B, then mixture C is assumed to be in the same skin corrosion packing group as A and B.

(e) Substantially similar mixtures: Given the following:

(i) Two mixtures: (A+B) and (C+B);

(ii) The concentration of ingredient B is the same in both mixtures;

(iii) The concentration of ingredient A in mixture (A+B) equals the concentration of ingredient C in mixture (C+B);

(iv) Data on skin corrosion for ingredients A and C are available and substantially equivalent, i.e. they are the same skin corrosion packing group and do not affect the skin corrosion potential of B.

If mixture (A+B) or (C+B) is already classified based on test data, then the other mixture may be assigned to the same packing group.

2.2.8.1.6.3 Calculation method based on the classification of the substances

2.2.8.1.6.3.1 Where a mixture has not been tested to determine its skin corrosion potential, nor is sufficient data available on similar mixtures, the corrosive properties of the substances in the mixture shall be considered to classify and assign a packing group.

Applying the calculation method is only allowed if there are no synergistic effects that make the mixture more corrosive than the sum of its substances. This restriction applies only if packing group II or III would be assigned to the mixture.

2.2.8.1.6.3.2 When using the calculation method, all Class 8 ingredients present at a concentration of $\geq$ 1% shall be taken into account, or $<$ 1% if these ingredients are still relevant for classifying the mixture to be corrosive to skin.

2.2.8.1.6.3.3 To determine whether a mixture containing corrosive substances shall be considered a corrosive mixture and to assign a packing group, the calculation method in the flow chart in Figure 2.2.8.1.6.3 shall be applied.

2.2.8.1.6.3.4 When a specific concentration limit (SCL) is assigned to a substance following its entry in Table A of Chapter 3.2 or in a special provision, this limit shall be used instead of the generic concentration limits (GCL). This appears where 1% is used in the first step for the assessment of the packing group I substances, and where 5% is used for the other steps respectively in Figure 2.2.8.1.6.3.

2.2.8.1.6.3.5 For this purpose, the summation formula for each step of the calculation method shall be adapted. This means that, where applicable, the generic concentration limit shall be substituted by the specific concentration limit assigned to the substance(s) (SCL_i), and the adapted formula is a weighted average of the different concentration limits assigned to the different substances in the mixture:

$$\frac{PGx_1}{GCL} + \frac{PGx_2}{SCL_2} + \cdots + \frac{PGx_i}{SCL_i} \geq 1$$

Where:

PG x_i = concentration of substance 1, 2 ...i in the mixture, assigned to packing group x (I, II or III)

GCL = generic concentration limit

SCL_i = specific concentration limit assigned to substance i

The criterion for a packing group is fulfilled when the result of the calculation is ≥ 1. The generic concentration limits to be used for the evaluation in each step of the calculation method are those found in Figure 2.2.8.1.6.3.

Examples for the application of the above formula can be found in the note below.

NOTE: *Examples for the application of the above formula*

Example 1: A mixture contains one corrosive substance in a concentration of 5% assigned to packing group I without a specific concentration limit:

Calculation for packing group I: $\frac{5}{5\ (GCL)} = 1$ ➔ *assign to Class 8, packing group I.*

Example 2: A mixture contains three substances corrosive to skin; two of them (A and B) have specific concentration limits; for the third one (C) the generic concentration limit applies. The rest of the mixture needs not to be taken into consideration:

Substance X in the mixture and its packing group assignment within Class 8	Concentration (conc) in the mixture in %	Specific concentration limit (SCL) for packing group I	Specific concentration limit (SCL) for packing group II	Specific concentration limit (SCL) for packing group III
A, assigned to packing group I	3	30%	none	none
B, assigned to packing group I	2	20%	10%	none
C, assigned to packing group III	10	none	none	none

Calculation for packing group I: $\frac{3\ (conc\ A)}{30\ (SCL\ PGI)} + \frac{2\ (conc\ B)}{20\ (SCL\ PGI)} = 0{,}2 < 1$

The criterion for packing group I is not fulfilled.

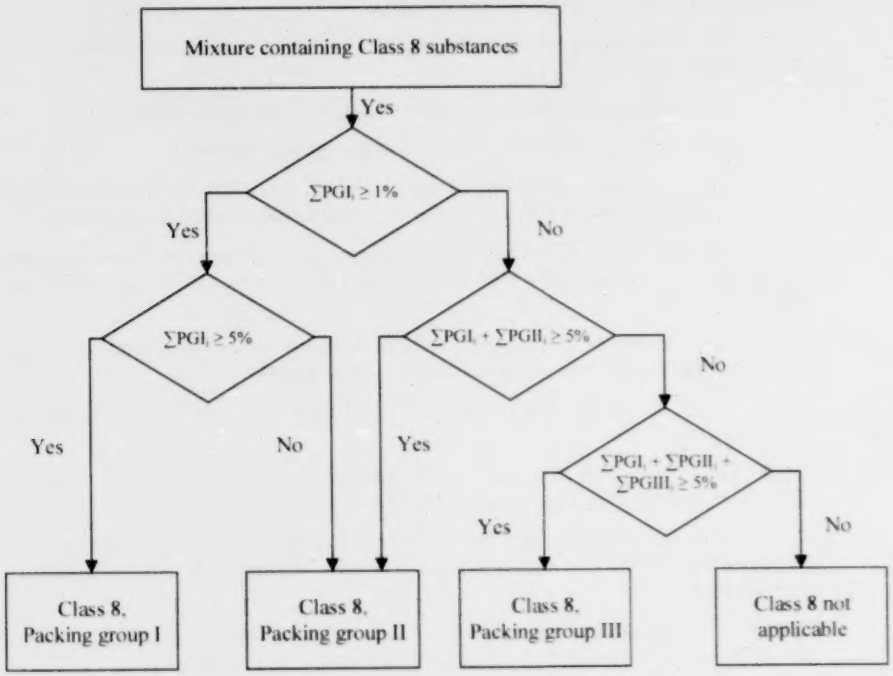
Calculation for packing group II: $\frac{3\ (conc\ A)}{5\ (GCL\ PG\ II)} + \frac{2\ (conc\ B)}{10\ (SCL\ PG\ II)} = 0{,}8 < 1$

The criterion for packing group II is not fulfilled.

Calculation for packing group III: $\frac{3\ (conc\ A)}{5\ (GCL\ PGIII)} + \frac{2\ (conc\ B)}{5\ (GCL\ PG\ III)} + \frac{10\ (conc\ C)}{5\ GCL\ PG\ III)} = 3 \geq 1$

The criterion for packing group III is fulfilled, the mixture shall be assigned to Class 8, packing group III.

Figure 2.2.8.1.6.3: Calculation method



".

2.2.8.1.7 and Note and 2.2.8.1.8 Remain unchanged.

2.2.8.1.9 Delete and insert "2.2.8.1.9 Deleted".

Existing Note before 2.2.8.2 remains unchanged.

2.2.8.2 (title), 2.2.8.2.1 and 2.2.8.2.2 Remain unchanged.

2.2.8.3, List of collective entries Keep existing text with the following amendment: In "Articles C11", add the following entry "3547 ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.".

2.2.9.1.2 The amendment does not apply to the English text.

2.2.9.1.3 Replace "2.2.9.1.4 to 2.2.9.1.14" by "2.2.9.1.4 to 2.2.9.1.8, 2.2.9.1.10, 2.2.9.1.11, 2.2.9.1.13 and 2.2.9.1.14".

2.2.9.1.7 At the end of the first paragraph, add the following Note:

"***NOTE:*** *For UN 3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT, see special provision 389 in Chapter 3.3.*".

2.2.9.1.7 Add the following new sub-paragraphs (f) and (g):

"(f) Lithium batteries, containing both primary lithium metal cells and rechargeable lithium ion cells, that are not designed to be externally charged (see special provision 387 of Chapter 3.3) shall meet the following conditions:

(i) The rechargeable lithium ion cells can only be charged from the primary lithium metal cells;

(ii) Overcharge of the rechargeable lithium ion cells is precluded by design;

(iii) The battery has been tested as a lithium primary battery;

(iv) Component cells of the battery shall be of a type proved to meet the respective testing requirements of the Manual of Tests and Criteria, part III, sub-section 38.3;

(g) Manufacturers and subsequent distributors of cells or batteries shall make available the test summary as specified in the Manual of Tests and Criteria, Part III, sub-section 38.3, paragraph 38.3.5.".

2.2.9.1.14 Amend the heading to read "Other substances and articles presenting a danger during carriage but not meeting the definitions of another class".

2.2.9.1.14 The amendment to the entry for "Low hazard dithionites" does not apply to the English text.

2.2.9.1.14 After "Vehicles, engines and machinery, internal combustion", insert the following new line: "Articles containing miscellaneous dangerous goods".

2.2.9.1.14 Amend existing entry for UN 2071 AMMONIUM NITRATE FERTILIZERS, including Notes 1 and 2 to read as follows: "UN 2071 AMMONIUM NITRATE BASED FERTILIZERS;

NOTE: *Solid ammonium nitrate based fertilizers shall be classified in accordance with the procedures as set out in the Manual of Tests and Criteria, Part III, Section 39.".*

2.2.9.1.14 In the Note, delete "*UN No. 2071 ammonium nitrate fertilizers, UN No. 2216 fish meal (fish scrap), stabilized,*".

2.2.9.1.14 In the Note, replace ", UN No. 3335 aviation regulated solid, n.o.s. and UN No. 3363 dangerous goods in machinery or dangerous goods in apparatus" by "and UN No. 3335 aviation regulated solid, n.o.s.".

2.2.9.3, List of entries For "Lithium batteries M4", add the following new entry:

"3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries".

2.2.9.3, List of entries The amendment to the title of subdivision M11 does not apply to the English text.

2.2.9.3, List of entries For "Other substances or articles presenting a danger during carriage, but not meeting the definitions of another class M11", add the following new entries:

"2071 AMMONIUM NITRATE BASED FERTILIZER
3363 DANGEROUS GOODS IN MACHINERY or
3363 DANGEROUS GOODS IN APPARATUS
3548 ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS N.O.S.".

2.2.9.3, List of entries For "Other substances or articles presenting a danger during carriage, but not meeting the definitions of another class M11", at the top of the list of entries, delete "No collective entry available.".

Chapter 2.4

2.4.4.6.5 At the end, delete "with the additional statement that: "x percent of the mixture consists of ingredients(s) of unknown hazards to the aquatic environment"".

Chapter 3.1

3.1.2.2 Amend the first sentence to read as follows: "When a combination of several distinct proper shipping names are listed under a single UN number, and these are separated by "and" or "or" in lower case or are punctuated by commas, only the most appropriate shall be shown in the transport document and package marks.". Delete the second sentence.

3.1.2.6 (a) After "Chapter 3.3," insert "7.1.7,".

3.1.2.6 Sub-paragraph (b) becomes sub-paragraph (c). Add the following new sub-paragraph (b):

"(b) Unless it is already included in capital letters in the name indicated in Column (2) of Table A in Chapter 3.2, the words "TEMPERATURE CONTROLLED" shall be added as part of the proper shipping name;".

3.1.2.8.1.1 The amendment does not apply to the English text.

3.1.2.8.1.2 Amend the first sentence to read as follows: "When a mixture of dangerous goods or articles containing dangerous goods are described by one of the "N.O.S." or "generic" entries to which special provision 274 has been allocated in Column (6) of Table A in Chapter 3.2, not more than the two constituents which most predominantly contribute to the hazard or hazards of the mixture or of the articles need to be shown, excluding controlled substances when their disclosure is prohibited by national law or international convention.". In the second sentence, replace "risk label" by "hazard label" (twice).

3.1.2.8.1.3 Add the following new example at the end:

"UN 3540 ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S. (pyrrolidine)".

3.1.2.8.1.4 Amend the examples after the introductory sentence to read as follows:

"UN 1268 PETROLEUM DISTILLATES, N.O.S (NAPHTHA), 110 kPa < pv50 ≤ 150 kPa;

UN 1993 FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE, 60 °C < INITIAL BOILING POINT ≤ 85 °C (containing ACETONE).".

Chapter 3.2, Table A

3.2.1 In the explanatory text for column (3b), in the penultimate indent, delete ", 8". Add a new indent right after to read as follows:

"- For dangerous substances or articles of Class 8, the codes are explained in 2.2.8.1.4.1;".

3.2.1 For UN Nos. 0349, 0367, 0384 and 0481, insert "347" in column (6).

3.2.1 For UN No. 0510, in column (9) insert "PP". In column (11) insert "LO01" and "HA01, HA03" and in column (12) insert "1".

3.2.1 For UN Nos. 1011, 1049, 1075, 1954, 1965, 1969, 1971, 1972 and 1978, insert "392" and delete "660" in column (6).

3.2.1 For UN Nos. 1011, 1075, 1965, 1969 and 1978, insert "674" in column (6).

3.2.1 For UN No. 1148, PG III, insert "T" in column (8).

3.2.1 For UN No. 1202, second entry In column (2) replace "EN 590:2013 + A1:2014" with "EN 590:2013 + A1:2017", twice.

3.2.1 For UN No. 2067, in column (6) delete "186".

3.2.1 For UN No. 2071, in Column (2), amend the designation to read "AMMONIUM NITRATE BASED FERTILIZER".

3.2.1 For UN No. 2908, in column (6) insert "368".

3.2.1 For UN No. 2913, in column (6) insert "325"

3.2.1 For UN No. 2913, in column (6) delete "336".

3.2.1 For UN Nos. 3090, 3091, 3480 and 3481, in column (6) insert "387".

3.2.1 For UN Nos. 3091 and 3481, replace "636" by "670" in column (6).

3.2.1 For UN No. 3166, delete "312" and "385" in column (6).

3.2.1 For UN Nos. 3166 and 3171, insert "388" in column (6).

3.2.1 For UN Nos. 3166, 3171, 3527 PG III, 3530, 3531, 3532, 3533 and 3534, in column (9) insert "PP" and in column (12) insert "0".

3.2.1 For UN No. 3171, delete "240" in column (6).

3.2.1 For UN No. 3302 in column (2) add at the end of the designation ", STABILIZED" and in column (6), add "386".

3.2.1 For UN No. 3316, delete the second entry corresponding to packing group III. In the remaining entry, in column (5), delete "II" and insert "671" in column (6).

3.2.1 For UN No. 3326, in column (6) insert "326".

3.2.1 For UN No. 3326, in column (6) delete "336".

3.2.1 For UN No. 3363, amend the entry to read as follows:

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8) – (13)
3363	DANGEROUS GOODS IN MACHINERY or DANGEROUS GOODS IN APPARATUS	9	M11		9	301 672	0	E0	

3.2.1 For UN No. 3527 PG II, in column (9) insert "PP" and in column (12) insert "1".

3.2.1 For UN Nos. 3528 and 3529, in column (9) insert "PP, EX, A". In column (10) insert "VE01" and in column (12) insert "(.

Add the following new entries:

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	TF3	I	6.1 +4.1	274	0	E5	P002 IBC99	PP, EP, EX, A	VE01		2	
3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	TF3	II	6.1 +4.1	274	500 g	E4	P002 IBC08	PP, EP, EX, A	VE01		2	
3536	LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries	9	M4		99	389	0	E0		PP			0	
3537	ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.	2	6F		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EX,A	VE01		1	
3538	ARTICLES CONTAINING NON-FLAMMABLE, NON TOXIC GAS, N.O.S.	2	6A		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP			0	
3539	ARTICLES CONTAINING TOXIC GAS, N.O.S.	2	6T		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EP, TOX, A	VE02		2	
3540	ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.	3	F3		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EX, A	VE01		1	
3541	ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.	4.1	F4		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP			0	

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)
3542	ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.	4.2	S6		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP			0	
3543	ARTICLES CONTAINING A SUBSTANCE WHICH IN CONTACT WITH WATER EMITS FLAMMABLE GASES, N.O.S.	4.3	W3		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EX, A	VE01	HA08	0	
3544	ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.	5.1	O3		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP			0	
3545	ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.	5.2	P1 or P2		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EX, A	VE01		0	
3546	ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.	6.1	T10		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EP, TOX A	VE02		0	
3547	ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.	8	C11		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP, EP			0	
3548	ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S.	9	M11		See 5.2.2.1.12	274 667	0	E0	P006 LP03	PP			0	

Chapter 3.2, Explanations concerning Table C

3.2.3.1 In the indents of the second paragraph, amend the last indent to read as follows:

"- If a cell contains an asterisk, "*", the applicable requirements should be determined by applying 3.2.3.3. The determination of the applicable requirements by applying 3.2.3.3 should take precedence over using the entries for mixtures for which no sufficient data is available.".

3.2.3.1 In explanatory note for column (5), replace the third and fourth paragraphs by the following:

"In the case of a substance or mixture with CMR properties, the code 'CMR' is added to the information.

CMR is used to indicate substances with long-term effects on health (*carcinogenic, mutagenic or toxic to reproduction*, Categories 1A and 1B in accordance with the criteria of Chapters 3.5, 3.6 and 3.7 of the GHS).

In the case of a substance or mixture hazardous to the aquatic environment, the code 'N1', 'N2' or 'N3' is added to the information. (See 2.2.9.1.10).".

3.2.3.1, column (10) Replace twice (in the title and in the text) "of the high-velocity vent valve" by "of the pressure relief valve/high-velocity vent valve".

3.2.3.1, column (16) Amend the text in brackets before the Note to read as follows:

"(flame arresters, vacuum relief valves, pressure relief valves/high velocity vent valves and devices for safe pressure relief of cargo tanks with integrated flame arrester plate stack).".

3.2.3.1, column (17) Replace "a code referring to" by "information on".

3.2.3.1, column (20) Amend the additional requirement or remark 5 to read as follows:

"5. This substance is liable to clog the venting piping and its fittings or the fittings of cargo tanks. Careful surveillance should be ensured.

If a closed-type tank vessel cargo tank is required for the carriage of this substance and explosion protection is necessary or the substance for which explosion protection is necessary is carried in a closed cargo tank, the cargo tank shall conform to 9.3.2.22.4 or 9.3.3.22.4 or the venting piping shall conform to 9.3.2.22.5 (a) or 9.3.2.22.5 (b) or to 9.3.3.22.5 (a) or 9.3.3.22.5 (b).

This requirement does not apply when the cargo tanks and the corresponding piping are inerted in accordance with 7.2.4.18.".

3.2.3.1, column (20) Amend additional requirement or remark 6 to read as follows:

"6. When external temperatures are below or equal to that indicated in column (20), the substance may only be carried in tank vessels equipped with a possibility of heating the cargo.

In addition, in the event of carriage in a closed cargo tank, the venting piping, the safety valves and the flame arresters shall be heatable.

The temperature of the venting piping, safety valves and flame arresters shall be kept at least above the melting point of the substance.".

3.2.3.1, column (20) Amend additional requirement or remark 7 to read as follows:

"7. If a closed cargo tank is required to carry this substance or if the substance is carried in a closed cargo tank, the venting piping, the safety valves and the flame arresters shall be heatable.

The temperature of the venting piping, safety valves and flame arresters shall be kept at least above the melting point of the substance.".

3.2.3.1, column (20), remark 12 Amend subparagraph (e) to read as follows:

"(e) The cargo tanks shall be entered and inspected prior to each loading of these substances to ensure freedom from contamination, heavy rust deposits or visible structural defects.

When these cargo tanks are fitted in type C tank vessels, with cargo tank design 1 and cargo tank type 1, and are in continuous service for these substances, such inspections shall be performed at intervals of not more than two and a half years.

When these cargo tanks are fitted in type G tank vessels, with cargo tank design 1 and cargo tank type 1, and are in continuous service for these substances, such inspections shall be performed during the periodic inspection for the renewal of the certificate of approval according to 1.16.10.".

3.2.3.1 In explanatory note for column (20), remark 31, replace "rapid blocking valve" by "quick closing valve".

3.2.3.1, Explanations concerning Table C, explanatory note for column (20), remark 33 subparagraph (i) Amendment does not apply to the English text.

3.2.3.1 In explanatory note for column (20), remark 33 (j), replace "degassed" by "made gasfree".

3.2.3.1 In "Explanations concerning Table C", for column (20) "Additional requirements/Remarks", add a new remark to read as follows:

"44. A substance shall only be assigned to this entry where there is measurement data or verified information in accordance with IEC 60079-20-1 or equivalent that allows for an assignment to subgroup II B3 of explosion group II B.".

Chapter 3.2, Table C

3.2.3.2 Amend the heading of column (10) to read as follows: "Opening pressure of the pressure relief valve/high velocity vent valve, in kPa".

3.2.3.2. Insert Note 12) for all entries with T1 and T2 in column (15).

3.2.3.2. For UN No. 1202, all entries, in column (2) replace "HEATING OIL (LIGHT)" by "HEATING OIL, LIGHT".

3.2.3.2. For UN No. 1202, second entry, in column (2) replace "EN 590:2009 + A1:2010" with "EN 590:2013 + A1:2017", twice.

3.2.3.2 For UN No. 1206, in column (12) replace "0.68" by "0.67 – 0.70".

3.2.3.2 For UN No. 1208 first row, in column (12) replace "0.66" by "0.65 – 0.70".

3.2.3.2 For UN No. 1262, in column (12) replace "0.7" by "0.69 – 0.71".

3.2.3.2 For UN No. 1664, delete "17" in column (20).

3.2.3.2 For UN No. 1764, insert "6:+13 °C" in column (20) before "17".

3.2.3.2 For UN No. 2057 packing group II:

In column (5)	Replace "3 +N3" by "3 + N1".
In column (6)	Replace "N" by "C".
In column (8)	Replace "3" by "2".
In column (13)	Replace "3" by "2".

3.2.3.2 For UN No. 2057 packing group III:

In column (5)	Replace "3 +N3" by "3 + N1".
In column (6)	Replace "N" by "C".
In column (7)	Replace "3" by "2".
In column (8)	Replace "3" by "2".
In column (13)	Replace "3" by "2".

3.2.3.2 For UN Nos. 2448, 3256 (all entries) and 3257 (all entries), insert "; 17" after "7" in column (20).

3.2.3.2 In the following entries, amend column (16) to read "II A":

1120	BUTANOLS (sec-BUTYLALCOHOL)
1191	OCTYL ALDEHYDES (n-OCTYLALDEHYDE)
1229	MESITYL OXYDE
1783	HEXAMETHYLENEDIAMINE SOLUTION, PG II
1783	HEXAMETHYLENEDIAMINE SOLUTION, PG III
2048	DICYCLOPENTADIENE
2053	METHYL ISOBUTYL CARBINOL
2057	TRIPROPYLENE, PG II
2057	TRIPROPYLENE, PG III
2357	CYCLOHEXYLAMINE
2485	n-BUTYL ISOCYANATE
2486	ISOBUTYL ISOCYANATE
2531	METHACRYLIC ACID, STABILIZED
2381	DIMETHYL DISULPHIDE
2618	VINYLTOLUENES, STABILIZED

3.2.3.2 In the following entries, amend column (16) to read "II B (II B1)":

1163	DIMETHYLHYDRAZINE, UNSYMMETRICAL
1274	n-PROPANOL or PROPYL ALCOHOL, NORMAL, PG II
1274	n-PROPANOL or PROPYL ALCOHOL, NORMAL, PG III
3475	ETHANOL AND GASOLINE MIXTURE or ETHANOL and MOTOR SPIRIT MIXTURE or ETHANOL AND PETROL MIXTURE, with more than 90 % ethanol

3.2.3.2 In the following entries, amend column (16) to read "II B (II B2)":

1188	ETHYLENE GLYCOL MONOMETHYL ETHER
1275	PROPIONALDEHYDE

3.2.3.2 In the following entries, amend column (16) to read "II B (II B3)":

1280	PROPYLENE OXIDE
1991	CHLOROPRENE, STABILIZED
2309	OCTADIENE (1,7-OCTADIENE)
2983	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURE, with not more than 30 % ethylene oxide

3.2.3.2 In the following entries, amend column (16) to read "II B (II B3[14])":

1578	CHLORONITROBENZENES, SOLID, MOLTEN
1663	NITROPHENOLS
2078	TOLUENE DIISOCYANATE (and isomeric mixtures) (2,4-TOLUENE DIISOCYANATE)
2205	ADIPONITRILE
2259	TRIETHYLENETETRAMINE
2280	HEXAMETHYLENEDIAMINE, SOLID, MOLTEN
3446	NITROTOLUENES, SOLID, MOLTEN (p-NITROTOLUENE)

3.2.3.2 Insert the following new entries:

3.2.3.2 For UN 3295, first 12 entries, in column (5) add "F" to the text in brackets, if applicable.

3.2.3.2 For UN No. 3295 "HYDROCARBONS, LIQUID, N.O.S. CONTAINING ISOPRENE AND PENTADIENE, STABILIZED" in column (18) add "EP" and "TOX".

3.2.3.2 For UN No. 3295 "HYDROCARBONS, LIQUID, N.O.S. (1-OCTEN)" in column (18) delete "EP" and "TOX".

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1148	DIACETONE ALCOHOL	3	F1	III	3	N	3	2			97	0.93	3	yes	T1	II A	yes	PP, EX, A	0	
1203	MOTOR SPIRIT or GASOLINE or PETROL, WITH MORE THAN 10 % BENZENE	3	F1	II	3+N2+CMR+F	C	•	•	•	•	•		•	yes	T3	II A	yes	•	1	*see 3.2.3.3
1224	KETONES, LIQUID, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	•	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	1	14; 27, 29; 44 *see 3.2.3.3
1224	KETONES, LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	•	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	0	14; 27, 44 *see 3.2.3.3
1267	PETROLEUM CRUDE OIL	3	F1	I	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	1	14; 44 *see 3.2.3.3
1267	PETROLEUM CRUDE OIL	3	F1	II	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	1	14; 44 *see 3.2.3.3
1267	PETROLEUM CRUDE OIL	3	F1	III	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	0	14; 44 *see 3.2.3.3
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+F+(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B[4]	yes	•	1	*see 3.2.3.3
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+F+(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	1	44 *see 3.2.3.3

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4]	yes	*	1	*see 3.2.3.3
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+F +(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	44 *see 3.2.3.3
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4]	yes	*	0	*see 3.2.3.3
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE	3	F1	III	3+CMR+F +(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	44 *see 3.2.3.3
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	I	3+CMR+ F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	29; 43; 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	29; 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	29; 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	2	2	3	50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	23; 29; 38; 44

(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	2	2	3	50	95		2	YES	T4 =	II B[a] (II B3)	YES	PP, EP, EX, TOX, A	1	23, 29, 38, 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	2	2		50	95		2	YES	T4 =	II B[a] (II B3)	YES	PP, EP, EX, TOX, A	1	29, 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	2	2		50	95		2	YES	T4 =	II B[a] (II B3)	YES	PP, EP, EX, TOX, A	0	29, 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115 °C	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	2	2		35	95		2	YES	T4 =	II B[a] (II B3)	YES	PP, EP, EX, TOX, A	1	29, 44
1267	PETROLEUM CRUDE OIL WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115 °C	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	2	2		35	95		2	YES	T4 =	II B[a] (II B3)	YES	PP, EP, EX, TOX, A	0	29, 44
1268	PETROLEUM DISTILLATES, NOS or PETROLEUM PRODUCTS, NOS	3	F1	I	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	YES	T4 =	II B[a] (II B3)	YES	•	1	14, 27, 44 •see 7.2.3.3

1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [3]	II B [4] (II B3)	yes	•	1	14, 27, 44 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [3]	II B [4] (II B3)	yes	•	0	14, 27, 44 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+ F+(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B [4]	yes	•	1	27 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+F +(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B [4] (II B3)	yes	•	1	27, 44 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B [4]	yes	•	1	27 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+F +(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B [4] (II B3)	yes	•	1	27, 44 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [3]	II B [4]	yes	•	0	27 *see 3.2.3.3

1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	III	3+CMR+F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	27, 44 *see 3.2.3.3
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	I	3+CMR+F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	27, 29, 43, 44
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	27, 29, 44
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	II	3+CMR+F+(N1, N2, N3)	C	2	2	3	50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	23, 27, 29, 38, 44

1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	2	2		50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	27; 29; 44
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115 °C	3	F1	II	3+CMR+ F+(N1, N2, N3)	C	2	2		35	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	27; 29; 44
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	I	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	14; 44 *see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	II	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	14; 44 *see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE	3	F1	III	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	14; 44 *see. 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+ F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4]	yes	*	1	*see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+F +(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	44 *see 3.2.3.3

1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B [4]	yes	*	1	*see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B [4] (II B3)	yes	*	1	44 *see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE	3	F1	III	3+CMR+F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B [4]	yes	*	0	*see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE	3	F1	III	3+CMR+F+(N1, N2, N3)	C	*	*	*	*	*		*	yes	T4 [3]	II B [4] (II B3)	yes	*	0	44 *see 3.2.3.3
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	I	3+CMR+F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	1	29; 43; 44
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	II	3+CMR+F+(N1, N2, N3)	C	1	1			95		1	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	1	29; 44
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	III	3+CMR+F+(N1, N2, N3)	C	2	2	3	50	95		2	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	0	23; 29; 38; 44

1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	2	2		50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	29; 44
1863	FUEL, AVIATION, TURBINE ENGINE WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115 °C	3	F1	III	3+CMR+ F+(N1, N2, N3)	C	2	2		35	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	29; 44
1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.	2	2F		2.1 + CMR	G	1	1			91		1	no	T4 [3]	II B[4]	yes	PP, EX, A, EP, TOX	1	2; 31
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	I	3+6.1+(N 1, N2, N3, CMR, F or S)	C	1	1	*	*	95		1	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27; 29; 44 *see 3.2.3.3
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	I	3+6.1+(N 1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27; 29; 44 *see 3.2.3.3
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	II	3+6.1+(N 1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27; 29; 44 *see 3.2.3.3
1986	ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.	3	FT1	III	3+6.1+(N 1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	27; 29; 44 *see 3.2.3.3

1987	ALCOHOLS, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	14; 27; 29; 44*see 3.2.3.3
1987	ALCOHOLS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	14; 27; 44 *see 3.2.3.3
1989	ALDEHYDES, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	14; 27; 29; 44 *see 3.2.3.3
1989	ALDEHYDES, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	14; 27; 44 *see 3.2.3.3
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	I	3+6.1+(N1, N2, N3, CMR, F or S)	C	1	1	*	*	95		1	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27; 29; 44 *see 3.2.3.3
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	I	3+6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27; 29; 44 *see 3.2.3.3
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	II	3+6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27; 29; 44 *see 3.2.3.3
1992	FLAMMABLE LIQUID, TOXIC, N.O.S.	3	FT1	III	3+6.1+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	27; 29; 44 *see 3.2.3.3

1993	FLAMMABLE LIQUID, N.O.S.	3	F1	I	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	14; 44*see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	14, 44 *see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	14; 44 *see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	I	3+(N1, N2, N3, CMR, F)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4]	yes	*	1	*see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	I	3+(N1, N2, N3, CMR, F)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	44*see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	II	3+(N1, N2, N3, CMR, F)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4]	yes	*	1	*see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	II	3+(N1, N2, N3, CMR, F)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	1	44 *see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	III	3+(N1, N2, N3, CMR, F)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4]	yes	*	0	*see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	III	3+(N1, N2, N3, CMR, F)	C	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	44 *see 3.2.3.3
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	I	3+(N1, N2, N3, CMR, F)	C	1	1			95		1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	29; 44

1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	II	3+(N1, N2, N3, CMR, F)	C	1	1			95		1	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	1	29, 44
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT ≤ 60 °C	3	F1	III	3+(N1, N2, N3, CMR, F)	C	1	1			95		1	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	0	29, 44
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	II	3+(N1, N2, N3, CMR, F)	C	2	2	3	50	95		2	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	1	23, 29, 38, 44
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	III	3+(N1, N2, N3, CMR, F)	C	2	2	3	50	95		2	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	0	23, 29, 38, 44
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	II	3+(N1, N2, N3, CMR, F)	C	2	2		50	95		2	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	1	29, 44
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	III	3+(N1, N2, N3, CMR, F)	C	2	2		50	95		2	yes	T4 [3]	II B [4] (II B3)	yes	PP, EP, EX, TOX, A	0	29, 44

1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115 °C	3	F1	II	3+(N1, N2, N3, CMR, F)	C	2	2		35	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	29, 44
1993	FLAMMABLE LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115 °C	3	F1	III	3+(N1, N2, N3, CMR, F)	C	2	2		35	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	29, 44
2920	CORROSIVE LIQUID, FLAMMABLE, N.O.S. (AQUEOUS SOLUTION OF HEXADECYLTRIMETHYL-AMMONIUM *CHLORIDE (50 %)* AND ETHANOL (35 %))	8	CF1	II	8+3+F	N	2	3		10	95	0,9	3	yes	T2	II B (II B3)	yes	PP, EP, EX, A	1	6: +7 °C, 17, 34, 44
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	I	3+8+(N1, N2, N3, CMR, F or S)	C	1	1	*	*	95		1	yes	T4 [3]	II B[4] (II B3)	yes	*	1	27, 29, 44 *see 3.2.3.3
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	I	3+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	yes	T4 [3]	II B[4] (II B3)	yes	*	1	27, 29, 44 *see 3.2.3.3
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	II	3+8+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	yes	T4 [3]	II B[4] (II B3)	yes	*	1	27, 29, 44 *see 3.2.3.3
2924	FLAMMABLE LIQUID, CORROSIVE, N.O.S.	3	FC	III	3+8+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[4] (II B3)	yes	*	0	27, 34 *see 3.2.3.3

2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	TF1	I	6.1+3+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		1	no	T4 [3]	II B[6] (II B3)	yes	PP, EP, EX, TOX, A	2	27, 29, 44 *see 3.2.3.3
2929	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S.	6.1	TF1	II	6.1+3+(N1, N2, N3, CMR, F or S)	C	2	2	*	*	95		2	no	T4 [3]	II B[6] (II B3)	yes	PP, EP, EX, TOX, A	2	27, 29, 44 *see 3.2.3.3
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point	3	F2	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	95		*	yes	T4 [3]	II B[6] (II B3)	yes	*	0	7, 17, 27, 44*see 3.2.3.3
3271	ETHERS, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[6] (II B3)	yes	*	1	14, 27, 29, 44 *see 3.2.3.3
3271	ETHERS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[6] (II B3)	yes	*	0	14, 27, 44 *see 3.2.3.3
3272	ESTERS, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T2	II B[6] (II B3)	yes	*	1	14, 27, 29, 44 *see 3.2.3.3
3272	ESTERS, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F or S)	*	*	*	*	*	*		*	yes	T4 [3]	II B[6] (II B3)	yes	*	0	14, 27, 44 *see 3.2.3.3

3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FT C	I	3+6.1+8+ (N1, N2, N3, CMR, F or S)	C	1	1	•	•	95		1	no	T4 [1]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27, 29, 44 *see 3.2.3.3
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FT C	I	3+6.1+8+ (N1, N2, N3, CMR, F or S)	C	2	2	•	•	95		1	no	T4 [1]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27, 29, 44 *see 3.2.3.3
3286	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.	3	FT C	II	3+6.1+8+ (N1, N2, N3, CMR, F or S)	C	2	2	•	•	95		2	no	T4 [1]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	27, 29, 44 *see 3.2.3.3
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	I	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [1]	II B[4] (II B3)	yes	•	1	14, 44 *see 3.2.3.3
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	II	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [1]	II B[4] (II B3)	yes	•	1	14, 44 *see 3.2.3.3
3295	HYDROCARBONS, LIQUID, N.O.S.	3	F1	III	3+(N1, N2, N3, CMR, F)	•	•	•	•	•	•		•	yes	T4 [1]	II B[4] (II B3)	yes	•	0	14, 44*see 3.2.3.3
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+ (N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [1]	II B[4]	yes	•	1	*see 3.2.3.3
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	I	3+CMR+(N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [1]	II B[4] (II B3)	yes	•	1	44 *see 3.2.3.3
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE	3	F1	II	3+CMR+ (N1, N2, N3)	C	•	•	•	•	•		•	yes	T4 [1]	II B[4]	yes	•	1	*see 3.2.3.3

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3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 60 °C < INITIAL BOILING POINT ≤ 85 °C	3	F1	III	3+CMR+ (N1, N2, N3)	C	2	2	3	50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	23, 29, 38, 44
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	II	3+CMR+ (N1, N2, N3)	C	2	2		50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	29, 44
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE 85 °C < INITIAL BOILING POINT ≤ 115 °C	3	F1	III	3+CMR+ (N1, N2, N3)	C	2	2		50	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	29, 44
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115°C	3	F1	II	3+CMR+ (N1, N2, N3)	C	2	2		35	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	1	29, 44
3295	HYDROCARBONS, LIQUID, N.O.S. WITH MORE THAN 10% BENZENE INITIAL BOILING POINT > 115°C	3	F1	III	3+CMR+ (N1, N2, N3)	C	2	2		35	95		2	yes	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	29, 44
3295	HYDROCARBONS, LIQUID, N.O.S. CONTAINING ISOPRENE AND PENTADIENE, STABILIZED	3	F1	I	3+inst.+ N2+CMR	C	2	2	3	50	95	0,678	1	yes	T4 [3]	II B[4] (II B3)	yes	PP, EX, A	1	3, 27, 44

3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3	FT1	I	3+6.1+(N1, N2, N3, CMR, F)	C	•	•	•	•	95		1	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	14, 27, 44 * see 3.2.3.3
3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3	FT1	II	3+6.1+(N1, N2, N3, CMR, F)	C	•	•	•	•	95		2	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	2	14, 27, 44 * see 3.2.3.3
3494	PETROLEUM SOUR CRUDE OIL, FLAMMABLE, TOXIC	3	FT1	III	3+6.1+(N1, N2, N3, CMR, F)	C	•	•	•	•	95		2	no	T4 [3]	II B[4] (II B3)	yes	PP, EP, EX, TOX, A	0	14, 27, 44 * see 3.2.3.3
9001	SUBSTANCES WITH A FLASH-POINT ABOVE 60 °C handed over for carriage or carried at a TEMPERATURE WITHIN A RANGE OF 15K BELOW THEIR FLASH-POINT OR SUBSTANCES WITH A FLASH-POINT > 60 °C, HEATED TO LESS THAN 15 K FROM THE FLASH-POINT	3	F4		3+(N1, N2, N3, CMR, F or S)	•	•	•	•	•	•		•	yes	T4 [3]	II B[4] (II B3)	yes	•	0	27, 44 *see 3.2.3.3
9002	SUBSTANCES HAVING A SELF-IGNITION TEMPERATURE ≤ 200 °C, N.O.S.	3	F5		3+(N1, N2, N3, CMR, F or S)	C	1	1	•	•	95		1	yes	T4	II B[4] (II B3)	yes	•	0	44 *see 3.2.3.3

3.2.3.2 Footnotes related to the list of substances Replace the heading "Footnotes related to the list of substances" by "Notes related to Table C".

3.2.3.2. Notes related to Table C Replace "12) (Deleted)" by "12) This temperature class does not apply for the selection of explosion protected installations and equipment. The surface temperature of explosion protected installations and equipment shall not exceed 200 °C.".

3.2.3.2 In the Notes related to Table C", add a new footnote to read as follows:

"[14] No maximum experimental safe gap (MESG) has been determined in accordance with a standardized determination procedure; thus, the substance is provisionally assigned to explosion group II B3, which is considered to be safe.".

3.2.3.3 In the flowchart for classification of liquids of Classes 3, 6.1, 8 and 9 for carriage in tanks in inland navigation, in the third box after the bullet point "Corrosive substances that react dangerously with water.", insert an additional bullet point to read: "Corrosive substances containing gases in solution".

3.2.3.3 Flowchart, Scheme A:

Replace "High-velocity vent valve opening pressure" by "Pressure relief valve/high velocity vent valve opening pressure" (four times).

3.2.3.3. Flowchart, Scheme B:

Replace "High-velocity vent valve opening pressure" by "Pressure relief valve/high velocity vent valve opening pressure" (three times).

3.2.3.3 In Scheme B, Criteria for equipment of vessels of type N with closed cargo tanks in the column "Corrosive substances" amend the third row to read as follows: "Packing group I or II with $P_{d\,50} > 12.5$ kPa or reacting dangerously with water or with gases in solution".

3.2.3.3 and 3.2.4.3 I Amend column (17) to read as follows:

"Column (17): Determination of whether anti-explosion protection is required

Yes - For substances with a flash-point ≤ 60 °C

- For substances that must be transported while heated to a temperature of less than 15 K below their flash-point

- For substances that must be transported while heated to a temperature of 15 K or more below their flash-point and where in column (9) (cargo tank equipment) only a possibility of cargo heating (2) and no cargo-heating system on board (4) is required

- For flammable gases

No - For all other substances".

3.2.3.3, column (18): in the heading, replace "flammable gas detectors" by "gas detectors".

3.2.3.3 and 3.2.4.3, column (20) Amend remark 17 to read as follows: "Reference shall be made in column (20) to remark 17 for substances when reference is made to remark 4, 6 or 7.".

3.2.4.3, A In columns (6), (7) and (8), replace "High-velocity vent valve opening pressure" by "Pressure relief valve/high velocity vent valve opening pressure" (11 times).

3.2.4.3, sub-paragraph 9. and 3.2.4.3 J, column (18) Amend footnote * to read as follows:

"* *Since there is no official international list of CMR substances of Categories 1A and 1B, pending the availability of such a list, the list of CMR substances of Categories 1A and 1B in Regulation (EC) No 1272/2008 of the European Parliament and of the Council, as amended, shall apply."*

3.2.4.3 J, column (18): In the heading, replace "flammable gas detectors" by "gas detectors".

Chapter 3.3

3.3.1 In the third sentence, replace "such as "Damaged Lithium Batteries"" by "such as "LITHIUM BATTERIES FOR DISPOSAL"".

Special provision 23 The amendment does not apply to the English text.

Special provision 61 The amendment does not apply to the English text.

Special provision 122 Replace "risks" by "hazards".

Special provision 172 In the introductory sentence and in (c), replace "risk(s)" by "hazard(s)". In (a), (b) and (d) replace "risk" by "hazard".

Delete special provision 186 and insert: "186 *(Deleted)*".

Special provision 188 After (a) and (b), add the following new Note:

"***NOTE:*** *When lithium batteries in conformity with 2.2.9.1.7 (f) are carried in accordance with this special provision, the total lithium content of all lithium metal cells contained in the battery shall not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery shall not exceed 10 Wh (see special provision 387).*"

Special provision 188 (c) Replace "2.2.9.1.7 (a) and (e)" by "2.2.9.1.7 (a), (e), (f) if applicable, and (g)".

Special provision 188 (d) Replace "protection against contact with conductive materials" by "protection against contact with electrically conductive material".

Special provision 188 (f) At the end, add the following:

"When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high.

NOTE: *Packages containing lithium batteries packed in conformity with the provisions of Part 4, Chapter 11, packing instructions 965 or 968 Section IB of the ICAO Technical Instructions that bear the mark as shown in 5.2.1.9 (lithium battery mark) and the label shown in 5.2.2.2.2, model No. 9A shall be deemed to meet the provisions of this special provision.*".

Special provision 188, in the first paragraph after (h) Add the following sentence at the end: "As used in this special provision "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.".

Special provision 193 Amend to read as follows:

"193 This entry may only be used for ammonium nitrate based compound fertilizers. They shall be classified in accordance with the procedure as set out in the Manual of Tests and

Criteria, Part III, Section 39. Fertilizers meeting the criteria for this UN number are subject to the requirements of ADN only when carried in bulk.

Delete special provision 240 and insert: "240 *(Deleted)*".

Special provision 250 In paragraph (a), delete: "(see Table S-3-8 of the Supplement)".

Special provision 251 Amend as follows:

In the first paragraph, replace the last sentence by:

"Such kits shall only contain dangerous goods that are permitted as:

(a) Excepted quantities not exceeding the quantity indicated by the code in column (7b) of Table A of Chapter 3.2, provided that the net quantity per inner packaging and net quantity per package are as prescribed in 3.5.1.2 and 3.5.1.3; or;

(b) Limited quantities as indicated in column (7a) of Table A of Chapter 3.2, provided that the net quantity per inner packaging does not exceed 250 ml or 250 g.".

In the second paragraph, delete the last sentence.

In the third paragraph, insert a new first sentence to read as follows:

"For the purposes of completion of the transport document as set out in 5.4.1.1.1, the packing group shown on the document shall be the most stringent packing group assigned to any individual substance in the kit.".

Special provision 280 The amendment does not apply to the English text.

Special provision 290 (b) In the first sentence, replace "risk" by "hazard".

Special provision 293 (b) After "Safety matches are", replace "matches which" by "matches that".

Special provision 307 Amend to read as follows:

"307 This entry may only be used for ammonium nitrate based fertilizers. They shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, Part III, Section 39 subject to the restrictions of 2.2.51.2.2, thirteenth indent. When used in the said Section 39, the term "competent authority" means the competent authority of the country of origin. If the country of origin is not a Contracting Party to ADN, the classification and conditions of carriage shall be recognized by the competent authority of the first country Contracting Party to ADN reached by the consignment.".

Special provision 310 In the first paragraph, replace "cells and batteries" by "cells or batteries", twice, and add "or LP905 of 4.1.4.3 of ADR, as applicable" at the end.

Delete special provision 312 and insert: "312 *(Deleted)*"

Special provision 339 (b) The amendment does not apply to the English text.

Special provision 361 (b) The amendment does not apply to the English text.

Special provision 363 Add the following new introductory sentence: "This entry may only be used when the conditions of this special provision are met. No other requirements of ADN apply.".

Special provision 363 (f) At the end, replace "requirements of 2.2.9.1.7" by "provisions of 2.2.9.1.7".

Special provision 363 Delete the introductory text under (g). Renumber existing (i) to (vi) under current (g) as (g) to (l).

Special provision 363 (l) Amend (l) to read as follows:

"(l) When the engine or machinery contains more than 1 000 *l* of liquid fuels, for UN No. 3528 and UN No. 3530, or the fuel tank has a water capacity of more than 1 000 *l*, for UN No. 3529:

- A transport document in accordance with 5.4.1 is required. This transport document shall contain the following additional statement "Transport in accordance with special provision 363"."

Special provision 363 Add a new sub-paragraph (m) to read as follows:

"(m) The requirements specified in packing instruction P005 of 4.1.4.1 of ADR shall be met.".

Special provision 369 In the first paragraph, replace "risks" by "hazards". In the third paragraph, replace "risk" by "hazard".

Special provision 376 Amend the text after the third paragraph to read as follows:

"Cells and batteries shall be packed in accordance with packing instructions P908 of 4.1.4.1 of ADR or LP904 of 4.1.4.3 of ADR, as applicable.

Cells and batteries identified as damaged or defective and liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of carriage shall be packed and carried in accordance with packing instruction P911 of 4.1.4.1 of ADR or LP906 of 4.1.4.3 of ADR, as applicable. Alternative packing and/or carriage conditions may be authorized by the competent authority of any ADN Contracting Party who may also recognize an approval granted by the competent authority of a country which is not an ADN Contracting Party provided that this approval has been granted in accordance with the procedures applicable according to RID, ADR, ADN, the IMDG Code or the ICAO Technical Instructions. In both cases the cells and batteries are assigned to transport category 0.

Packages shall be marked "DAMAGED/DEFECTIVE LITHIUM-ION BATTERIES" or "DAMAGED/DEFECTIVE LITHIUM METAL BATTERIES", as applicable.

The transport document shall include the following statement "Transport in accordance with special provision 376".

If applicable, a copy of the competent authority approval shall accompany the carriage.".

Special provision 377 In the second paragraph, replace "requirements of 2.2.9.1.7 (a) to (e)" by "provisions of 2.2.9.1.7 (a) to (g)".

Special provision 385 Delete and insert "385 *(Deleted)*".

Special provision 386 In the first sentence, after "2.2.41.1.17," insert "7.1.7.".

"387 – 499 Reserved" Replace by *"393 – 499 Reserved"*.

Special provision 636 Amend to read as follows:

"636 Up to the intermediate processing facility, lithium cells and batteries with a gross mass of not more than 500 g each, lithium ion cells with a Watt-hour rating of not more than 20 Wh, lithium ion batteries with a Watt-hour rating of not more than 100 Wh, lithium metal cells with a lithium content of not more than 1 g and lithium metal batteries with an aggregate lithium content of not more than 2 g, not contained in equipment, collected and handed over for carriage for sorting, disposal or recycling, together with or without other non-lithium cells or batteries, are not subject to the other provisions of ADN including special provision 376 and 2.2.9.1.7, if the following conditions are met:

(a) The cells and batteries are packed according to packing instruction P909 of 4.1.4.1 of ADR except for the additional requirements 1 and 2;

(b) A quality assurance system is in place to ensure that the total amount of lithium cells and batteries per transport unit does not exceed 333 kg;

NOTE: *The total quantity of lithium cells and batteries in the mix may be assessed by means of a statistical method included in the quality assurance system. A copy of the quality assurance records shall be made available to the competent authority upon request.*

(c) Packages are marked "LITHIUM BATTERIES FOR DISPOSAL" or "LITHIUM BATTERIES FOR RECYCLING" as appropriate.".

Special provision 660 Amend to read as follows:

"660 For the carriage of fuel gas containment systems designed and approved to be fitted in motor vehicles containing this gas the provisions of 4.1.4.1 and Chapter 6.2 of ADR need not be applied when carried for disposal, recycling, repair, inspection, maintenance or from where they are manufactured to a vehicle assembly plant, provided the conditions described in special provision 392 are met. This also applies for mixtures of gases subject to special provision 392 and gases of group A subject to this special provision.".

Special provision 663 Under "General provisions:", replace "risk" by "hazard" (twice).

Special provision 666 Amend the first paragraph to read as follows:

"Vehicles and battery powered equipment, referred to by special provision 388, when carried as a load, as well as any dangerous goods they contain that are necessary for their operation or the operation of their equipment, are not subject to any other provisions of ADN, provided the following conditions are met:".

Special provision 667 In (a), (b), (b) (i) and (b) (ii), replace "or machinery" by ", machinery or article" and add the following new sub-paragraph (c):

"(c) The procedures described in (b) also apply to damaged lithium cells or batteries in vehicles, engines, machinery or articles.".

Special provision 667 (a) and (b) Replace "requirements of 2.2.9.1.7" by "provisions of 2.2.9.1.7".

3.3.1 Add the following new special provisions:

"301 This entry only applies to machinery or apparatus containing dangerous goods as a residue or an integral element of the machinery or apparatus. It shall not be used for machinery or apparatus for which a proper shipping name already exists in Table A of Chapter 3.2. Machinery and apparatus carried under this entry shall only contain dangerous goods which are authorized to be carried in accordance with the provisions of Chapter 3.4 (Limited quantities). The quantity of dangerous goods in machinery or apparatus shall not exceed the quantity specified in Column (7a) of Table A of Chapter 3.2 for each item of dangerous goods contained. If the machinery or apparatus contains more than one item of dangerous goods, the individual dangerous goods shall be enclosed to prevent them reacting dangerously with one another during carriage (see 4.1.1.6 of ADR). When it is required to ensure liquid dangerous goods remain in their intended orientation, orientation arrows shall be displayed on at least two opposite vertical sides with the arrows pointing in the correct direction in accordance with 5.2.1.10.

NOTE: *In this special provision the reference to "a proper shipping name which already exists" excludes specific n.o.s. entries for UN Nos. 3537 to 3548.".*

"387 Lithium batteries in conformity with 2.2.9.1.7 (f) containing both primary lithium metal cells and rechargeable lithium ion cells shall be assigned to UN Nos. 3090 or 3091 as

appropriate. When such batteries are carried in accordance with special provision 188, the total lithium content of all lithium metal cells contained in the battery shall not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery shall not exceed 10 Wh.".

"388 UN No. 3166 entries apply to vehicles powered by flammable liquid or gas internal combustion engines or fuel cells.

Vehicles powered by a fuel cell engine shall be assigned to the entries UN No. 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN No. 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed.

Other vehicles which contain an internal combustion engine shall be assigned to the entries UN No. 3166 VEHICLE, FLAMMABLE GAS POWERED or UN No. 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, carried with the battery(ies) installed.

If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it shall be assigned to UN No. 3166 VEHICLE, FLAMMABLE GAS POWERED.

Entry UN No. 3171 only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries carried with these batteries installed.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with a motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position), wheelchairs, lawn tractors, self-propelled farming and construction equipment, boats and aircraft. This includes vehicles carried in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries shall be assigned to the entries UN No. 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN No. 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT or UN No. 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or UN No. 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT, as appropriate.

Dangerous goods, such as batteries, airbags, fire extinguishers, compressed gas accumulators, safety devices and other integral components of the vehicle that are necessary for the operation of the vehicle or for the safety of its operator or passengers, shall be securely installed in the vehicle and are not otherwise subject to ADN. However, lithium batteries shall meet the provisions of 2.2.9.1.7, except as otherwise provided for in special provision 667.

Where a lithium battery installed in a vehicle or equipment is damaged or defective, the vehicle or equipment shall be carried in accordance with the conditions defined in special provision 667 (c).".

"389 This entry only applies to cargo transport units in which lithium ion batteries or lithium metal batteries are installed and which are designed only to provide power external

to the unit. The lithium batteries shall meet the provisions of 2.2.9.1.7 (a) to (g) and contain the necessary systems to prevent overcharge and over discharge between the batteries.

The batteries shall be securely attached to the interior structure of the cargo transport unit (e.g., by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the cargo transport unit under the shocks, loadings and vibrations normally incident to carriage. Dangerous goods necessary for the safe and proper operation of the cargo transport unit (e.g., fire extinguishing systems and air conditioning systems), shall be properly secured to or installed in the cargo transport unit and are not otherwise subject to ADN. Dangerous goods not necessary for the safe and proper operation of the cargo transport unit shall not be carried within the cargo transport unit.

The batteries inside the cargo transport unit are not subject to marking or labelling requirements. The cargo transport unit shall bear orange-coloured plates in accordance with 5.3.2.2 and placards in accordance with 5.3.1.1 on two opposing sides.".

"390 *(Reserved)*".

"391 *(Reserved)*".

"392 For the carriage of fuel gas containment systems designed and approved to be fitted in motor vehicles containing this gas the provisions of 4.1.4.1 and Chapter 6.2 of ADR need not be applied when carried for disposal, recycling, repair, inspection, maintenance or from where they are manufactured to a vehicle assembly plant, provided the following conditions are met:

(a) The fuel gas containment systems shall meet the requirements of the standards or regulations for fuel tanks for vehicles, as applicable. Examples of applicable standards and regulations are:

LPG tanks	
UN Regulation No. 67 Revision 2	Uniform provisions concerning: I. Approval of specific equipment of vehicles of category M and N using liquefied petroleum gases in their propulsion system; II. Approval of vehicles of category M and N fitted with specific equipment for the use of liquefied petroleum gases in their propulsion system with regard to the installation of such equipment
UN Regulation No. 115	Uniform provisions concerning the approval of: I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion systems; II Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system

CNG and LNG tanks	
UN Regulation No. 110	Uniform provisions concerning the approval of: I. Specific components of motor vehicles using compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system
UN Regulation No. 115	Uniform provisions concerning the approval of: I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion systems; II Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system
ISO 11439:2013	Gas cylinders — High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles
ISO 15500-Series	Road vehicles -- Compressed natural gas (CNG) fuel system components – several parts as applicable
ANSI NGV 2	Compressed natural gas vehicle fuel containers
CSA B51 Part 2:2014	Boiler, pressure vessel, and pressure piping code Part 2 Requirements for high-pressure cylinders for on-board storage of fuels for automotive vehicles
Hydrogen pressure tanks	
Global Technical Regulation (GTR) No. 13	Global technical regulation on hydrogen and fuel cell vehicles (ECE/TRANS/180/Add.13).
ISO/TS 15869:2009	Gaseous hydrogen and hydrogen blends - Land vehicle fuel tanks
Regulation (EC) No.79/2009	Regulation (EC) No. 79/2009 of the European Parliament and of the Council of 14 January 2009 on type approval of hydrogen-powered motor vehicles, and amending Directive 2007/46/EC
Regulation (EU) No. 406/2010	Commission Regulation (EU) No 406/2010 of 26 April 2010 implementing Regulation (EC) No 79/2009 of the European Parliament and of the Council on type-approval of hydrogen-powered motor vehicles
UN Regulation No. 134	Hydrogen and fuel cell vehicles (HFCV)
CSA B51 Part 2: 2014	Boiler, pressure vessel, and pressure piping code - Part 2: Requirements for high-pressure cylinders for on-board storage of fuels for automotive vehicles

Gas tanks designed and constructed in accordance with previous versions of relevant standards or regulations for gas tanks for motor vehicles, which were applicable at the time

of the certification of the vehicles for which the gas tanks were designed and constructed may continue to be carried;

(b) The fuel gas containment systems shall be leakproof and shall not exhibit any signs of external damage which may affect their safety;

NOTE 1: *Criteria may be found in standard ISO 11623:2015 Transportable gas cylinders – Periodic inspection and testing of composite gas cylinders (or ISO 19078:2013 Gas cylinders – Inspection of the cylinder installation, and requalification of high pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles).*

NOTE 2: *If the fuel gas containment systems are not leakproof or are overfilled or if they exhibit damage that could affect their safety (e.g. in case of a safety related recall), they shall only be carried in salvage pressure receptacles in conformity with ADN.*

(c) If a fuel gas containment system is equipped with two valves or more integrated in line, the two valves shall be closed as to be gastight under normal conditions of carriage. If only one valve exists or only one valve works, all openings with the exception of the opening of the pressure relief device shall be closed as to be gastight under normal conditions of carriage;

(d) Fuel gas containment systems shall be carried in such a way as to prevent obstruction of the pressure relief device or any damage to the valves and any other pressurised part of the fuel gas containment systems and unintentional release of the gas under normal conditions of carriage. The fuel gas containment system shall be secured in order to prevent slipping, rolling or vertical movement;

(e) Valves shall be protected by one of the methods described in 4.1.6.8 (a) to (e) of ADR;

(f) Except for the case of fuel gas containment systems removed for disposal, recycling, repair, inspection or maintenance, they shall be filled with not more than 20% of their nominal filling ratio or nominal working pressure, as applicable;

(g) Notwithstanding the provisions of Chapter 5.2, when fuel gas containment systems are consigned in a handling device, marks and labels may be affixed to the handling device; and

(h) Notwithstanding the provisions of 5.4.1.1.1 (f) the information on the total quantity of dangerous goods may be replaced by the following information:

(i) The number of fuel gas containment systems; and

(ii) In the case of liquefied gases the total net mass (kg) of gas of each fuel gas containment system and, in the case of compressed gases, the total water capacity (l) of each fuel gas containment system followed by the nominal working pressure.

Examples for information in the transport document:

Example 1: "UN 1971 natural gas, compressed, 2.1, 1 fuel gas containment system of 50 *l* in total, 200 bar".

Example 2: "UN 1965 hydrocarbon gas mixture, liquefied, n.o.s., 2.1, 3 fuel gas containment systems, each of 15 kg net mass of gas".".

"670 (a) Lithium cells and batteries installed in equipment from private households collected and handed over for carriage for depollution, dismantling, recycling or disposal are not subject to the other provisions of ADN including special provision 376 and 2.2.9.1.7 when:

(i) They are not the main power source for the operation of the equipment in which they are contained;

(ii) The equipment in which they are contained does not contain any other lithium cell or battery used as the main power source; and

(iii) They are afforded protection by the equipment in which they are contained.

Examples for cells and batteries covered by this paragraph are button cells used for data integrity in household appliances (e.g. refrigerators, washing machines, dishwashers) or in other electrical or electronic equipment;

(b) Up to the intermediate processing facility lithium cells and batteries contained in equipment from private households not meeting the requirements of (a) collected and handed over for carriage for depollution, dismantling, recycling or disposal are not subject to the other provisions of ADN including special provision 376 and 2.2.9.1.7, if the following conditions are met:

(i) The equipment is packed in accordance with packing instruction P909 of 4.1.4.1 of ADR except for the additional requirements 1 and 2; or it is packed in strong outer packagings, e.g. specially designed collection receptacles, which meet the following requirements:

- The packagings shall be constructed of suitable material and be of adequate strength and design in relation to the packaging capacity and its intended use. The packagings need not meet the requirements of 4.1.1.3 of ADR;

- Appropriate measures shall be taken to minimize the damage of the equipment when filling and handling the packaging, e.g. use of rubber mats; and

- The packagings shall be constructed and closed so as to prevent any loss of contents during carriage, e.g. by lids, strong inner liners, covers for transport. Openings designed for filling are acceptable if they are constructed so as to prevent loss of content;

(ii) A quality assurance system is in place to ensure that the total amount of lithium cells and batteries per transport unit does not exceed 333 kg;

NOTE: *The total quantity of lithium cells and batteries in the equipment from private households may be assessed by means of a statistical method included in the quality assurance system. A copy of the quality assurance records shall be made available to the competent authority upon request.*

(iii) Packages are marked "LITHIUM BATTERIES FOR DISPOSAL" or "LITHIUM BATTERIES FOR RECYCLING" as appropriate.

If equipment containing lithium cells or batteries is carried unpackaged or on pallets in accordance with packing instruction P909 (3) of 4.1.4.1 of ADR, this mark may alternatively be affixed to the external surface of the vehicles, wagons or containers).

NOTE: *"Equipment from private households" means equipment which comes from private households and equipment which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Equipment likely to be used by both private households and users other than private households shall in any event be considered to be equipment from private households."*

"671 For the purposes of the exemption related to quantities carried on board vessels (see 1.1.3.6), the transport category shall be determined in relation to the packing group (see paragraph 3 of special provision 251):

- Transport category 3 for kits assigned to packing group III;
- Transport category 2 for kits assigned to packing group II;
- Transport category 1 for kits assigned to packing group I.".

"672 Machinery and apparatus carried under this entry and in conformity with special provision 301 are not subject to any other provision of ADN provided they are either:

- packed in a strong outer packaging constructed of suitable material, and of adequate strength and design in relation to the packaging's capacity and its intended use, and meeting the applicable requirements of 4.1.1.1 of ADR; or
- carried without outer packaging if the machinery or apparatus is constructed and designed so that the receptacles containing the dangerous goods are afforded adequate protection."

"673 *(Reserved)*".

"674 This special provision applies to periodic inspection and test of over-moulded cylinders as defined in 1.2.1.

Over-moulded cylinders subject to 6.2.3.5.3.1 of ADR shall be subject to periodic inspection and test in accordance with 6.2.1.6.1 of ADR, adapted by the following alternative method:

- Substitute test required in 6.2.1.6.1 d) of ADR by alternative destructive tests;
- Perform specific additional destructive tests related to the characteristics of over-moulded cylinders.

The procedures and requirements of this alternative method are described below.

Alternative method:

(a) General

The following provisions apply to over-moulded cylinders produced serially and based on welded steel cylinders in accordance with EN 1442:2017, EN 14140:2014 + AC:2015 or annex I, parts 1 to 3 to Council Directive 84/527/EEC. The design of the over-moulding shall prevent water from penetrating on to the inner steel cylinder. The conversion of the steel cylinder to an over-moulded cylinder shall comply with the relevant requirements of EN 1442:2017 and EN 14140:2014 + AC:2015.

Over-moulded cylinders shall be equipped with self-closing valves.

(b) Basic population

A basic population of over-moulded cylinders is defined as the production of cylinders from only one over-moulding manufacturer using new inner cylinders manufactured by only one manufacturer within one calendar year, based on the same design type, the same materials and production processes.

(c) Sub-groups of a basic population

Within the above defined basic population, over-moulded cylinders belonging to different owners shall be separated into specific sub-groups, one per owner.

If the whole basic population is owned by one owner, the sub-group equals the basic population.

(d) Traceability

Inner steel cylinder marks in accordance with 6.2.3.9 of ADR shall be repeated on the over-moulding. In addition, each over-moulded cylinder shall be fitted with an individual resilient electronic identification device. The detailed characteristics of the over-moulded cylinders shall be recorded by the owner in a central database. The database shall be used to:

- Identify the specific sub-group;
- Make available to inspection bodies, filling centres and competent authorities the specific technical characteristics of the cylinders consisting of at least the following: serial number, steel cylinder production batch, over-moulding production batch, date of over-moulding;
- Identify the cylinder by linking the electronic device to the database with the serial number;
- Check individual cylinder history and determine measures (e.g. filling, sampling, retesting, withdrawal);
- Record performed measures including the date and the address of where it was done.

The recorded data shall be kept available by the owner of the over-moulded cylinders for the entire life of the sub-group.

(e) Sampling for statistical assessment

The sampling shall be random among a sub-group as defined in sub-paragraph (c). The size of each sample per sub-group shall be in accordance with the table in sub-paragraph (g).

(f) Test procedure for destructive testing

The inspection and test required by 6.2.1.6.1 of ADR shall be carried out except (d) which shall be substituted by the following test procedure:

- Burst test (according to EN 1442:2017 or EN 14140:2014 + AC:2015).

In addition, the following tests shall be performed:

- Adhesion test (according to EN 1442:2017 or EN 14140:2014 + AC:2015);
- Peeling and Corrosion tests (according to EN ISO 4628-3:2016).

Adhesion test, peeling and corrosion tests, and burst test shall be performed on each related sample according to the table in sub-paragraph (g) and shall be conducted after the first 3 years in service and every 5 years thereafter.

(g) Statistical evaluation of test results –Method and minimum requirements

The procedure for statistical evaluation according to the related rejection criteria is described in the following.

Test interval (years)	Type of test	Standard	Rejection criteria	Sampling out of a sub-group
After 3 years in service (see (f))	Burst test	EN 1442:2017	Burst pressure point of the representative sample must be above the lower limit of tolerance interval on the Sample Performance Chart $\Omega_m \geq 1 + \Omega_s \times k3(n;p;1-\alpha)$ [a] No individual test result shall be less than the test pressure	$3\sqrt[3]{Q}$ or Q/200 whichever is lower, and with a minimum of 20 per sub-group (Q)
	Peeling and corrosion	EN ISO 4628-3:2016	Max corrosion grade Ri2	Q/1 000
	Adhesion of Polyurethane	ISO 2859-1:1999 + A1:2011 EN 1442:2017 EN 14140:2014 + AC:2015	Adhesion value > 0.5 N/mm²	See ISO 2859-1:1999 + A1:2011 applied to Q/1000
Every 5 years thereafter (see (f))	Burst test	EN 1442:2017	Burst pressure point of the representative sample must be above the lower limit of tolerance interval on the Sample Performance Chart $\Omega_m \geq 1 + \Omega_s \times k3(n;p;1-\alpha)$ [a] No individual test result shall be less than the test pressure	$6\sqrt[3]{Q}$ or Q/100 whichever is lower, and with a minimum of 40 per sub-group (Q)
	Peeling and corrosion	EN ISO 4628-3:2016	Max corrosion grade Ri2	Q/1 000
	Adhesion of Polyurethane	ISO 2859-1:1999 + A1:2011 EN 1442:2017 EN 14140:2014 + AC:2015	Adhesion value > 0.5 N/mm²	See ISO 2859-1:1999 + A1:2011 applied to Q/1000

[a] *Burst pressure point (BPP) of the representative sample is used for the evaluation of test results by using a Sample Performance Chart:*

Step 1: Determination of the burst pressure point (BPP) of a representative sample

Each sample is represented by a point whose coordinates are the mean value of burst test results and the standard deviation of burst test results, each normalised to the relevant test pressure.

$$BPP: (\Omega_s = \frac{s}{PH} ; \Omega_m = \frac{x}{PH})$$

with

x: sample mean value;

s: sample standard deviation;

PH: test pressure

Step 2: Plotting on a Sample Performance Chart

Each BPP is plotted on a Sample Performance Chart with following axis:

- *Abscissa: Standard Deviation normalised to test pressure (Ω_s)*
- *Ordinate: Mean value normalised to test pressure (Ω_m)*

Step 3: Determination of the relevant lower limit of tolerance interval in the Sample Performance Chart

Results for burst pressure shall first be checked according to the Joint Test (multidirectional test) using a significance level of $\alpha = 0.05$ (see paragraph 7 of ISO 5479:1997) to determine whether the distribution of results for each sample is normal or non-normal.

- *For a normal distribution, the determination of the relevant lower limit of tolerance is given in step 3.1.*
- *For a non-normal distribution, the determination of the relevant lower limit of tolerance is given in step 3.2.*

Step 3.1: Lower limit of tolerance interval for results following a normal distribution

In accordance with the standard ISO 16269-6:2014, and considering that the variance is unknown, the unilateral statistical tolerance interval shall be considered for a confidence level of 95% and a fraction of population equal to 99.9999%.

By application in the Sample Performance Chart, the lower limit of tolerance interval is represented by a line of constant survival rate defined by the formula:

$$\Omega_m = 1 + \Omega_s \times k3\,(n; p; 1 - \alpha)$$

with:

k3: factor function of n, p and 1-α,

p: proportion of the population selected for the tolerance interval (99.9999%),

1- α: confidence level (95%),

n: sample size.

The value for k3 dedicated to Normal Distributions shall be taken from the table at end of Step 3.

Step 3.2: Lower limit of tolerance interval for results following a non-normal distribution

The unilateral statistical tolerance interval shall be calculated for a confidence level of 95% and a fraction of population equal to 99.9999%.

The lower limit of tolerance is represented by a line of constant survival rate defined by the formula given in previous step 3.1, with factors k3 based and calculated on the properties of a Weibull Distribution.

The value for k3 dedicated to Weibull Distributions shall be taken from the table below at end of Step 3.

Table for k3 *p=99.9999% and (1-α)=0.95*		
Sample size ***n***	***Normal distribution*** ***k3***	***Weibull distribution*** ***k3***
20	*6.901*	*16.021*
22	*6.765*	*15.722*
24	*6.651*	*15.472*
26	*6.553*	*15.258*
28	*6.468*	*15.072*
30	*6.393*	*14.909*
35	*6.241*	*14.578*
40	*6.123*	*14.321*
45	*6.028*	*14.116*
50	*5.949*	*13.947*
60	*5.827*	*13.683*
70	*5.735*	*13.485*
80	*5.662*	*13.329*
90	*5.603*	*13.203*
100	*5.554*	*13.098*
150	*5.393*	*12.754*
200	*5.300*	*12.557*
250	*5.238*	*12.426*
300	*5.193*	*12.330*
400	*5.131*	*12.199*
500	*5.089*	*12.111*
1000	*4.988*	*11.897*
∞	*4.753*	*11.408*

NOTE: *If sample size is between two values, the closest lower sample size shall be selected.*

(h) Measures if the acceptance criteria are not met

If a result of the burst test, peeling and corrosion test or adhesion test does not comply with the criteria detailed in the table in paragraph (g), the affected sub-group of over-moulded cylinders shall be segregated by the owner for further investigations and not be filled or made available for transport and use.

In agreement with the competent authority or the Xa-body which issued the design approval, additional tests shall be performed to determine the root cause of the failure.

If the root cause cannot be proved to be limited to the affected sub-group of the owner, the competent authority or the Xa-body shall take measures concerning the whole basic population and potentially other years of production.

If the root cause can be proved to be limited to a part of the affected sub-group, not affected parts may be authorized by the competent authority to return to service. It shall be proved that no individual over-moulded cylinder returning to service is affected.

(i) Filling centre requirements

The owner shall make available to the competent authority documentary evidence that the filling centres:

- Comply with the provisions of packing instruction P200 (7) of 4.1.4.1 of ADR and that the requirements of the standard on pre-fill inspections referenced in table P200 (11) of 4.1.4.1 of ADR are fulfilled and correctly applied;

- Have the appropriate means to identify over-moulded cylinders through the electronic identification device;

- Have access to the database as defined in (d);

- Have the capacity to update the database;

- Apply a quality system, according to the standard ISO 9000 (series) or equivalent, certified by an accredited independent body recognized by the competent authority.".

Chapter 5.2

5.2.1 After the heading, renumber the Note as Note 1 and add a new Note 2:

"***NOTE 2:*** *In accordance with the GHS, a GHS pictogram not required by ADN should only appear in carriage as part of a complete GHS label and not independently (see GHS 1.4.10.4.4).*"

5.2.1.3 After "Salvage packagings" add ", including large salvage packagings.".

5.2.1.9.2 In the last paragraph, after "black on white" insert "or suitable contrasting background".

5.2.1.10.1 In the second indent, at the end, delete "and". In the third indent, at the end, replace the comma by "; and". Add the following new fourth indent:

"- machinery or apparatus containing liquid dangerous goods when it is required to ensure the liquid dangerous goods remain in their intended orientation (see special provision 301 of Chapter 3.3).".

5.2.2.1 Add the following new sub-section 5.2.2.1.12:

"5.2.2.1.12 *Special provisions for the labelling of articles containing dangerous goods carried as UN Nos. 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547 and 3548*

5.2.2.1.12.1 Packages containing articles or articles carried unpackaged shall bear labels according to 5.2.2.1 reflecting the hazards established according to 2.1.5, except that for articles that in addition contain lithium batteries, a lithium battery mark or a label conforming to model No. 9A is not required.

5.2.2.1.12.2 When it is required to ensure articles containing liquid dangerous goods remain in their intended orientation, orientation arrows meeting 5.2.1.10.1 shall be affixed and visible on at least two opposite vertical sides of the package or of the unpackaged article where possible, with the arrows pointing in the correct upright direction.".

5.2.2.2.1.1.3 In the first sentence, after "the dimensions may be reduced" add "proportionally". Delete the second and third sentences ("The line inside the edge shall remain 5 mm to the edge of the label. The minimum width of the line inside the edge shall remain 2 mm.").

5.2.2.2.1.2 The amendment to the first paragraph does not apply to the English text. In the paragraph after the Note, replace "risk" by "hazard".

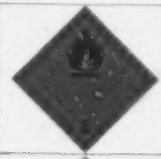
5.2.2.2.1.3 The amendment does not apply to the English text.

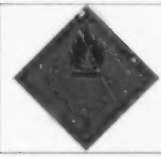
5.2.2.2.1.5 Replace "risk" by "hazard".

5.2.2.2.2 Amend to read as follows:

"5.2.2.2.2 *Specimen labels*

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 1 hazard: Explosive substances or articles						
1	Divisions 1.1, 1.2, 1.3	Exploding bomb: black	Orange	1 (black)		-** Place for division – to be left blank if explosive is the subsidiary hazard -* Place for compatibility group – to be left blank if explosive is the subsidiary hazard
1.4	Division 1.4	1.4: black Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.5	Division 1.5	1.5: black Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.6	Division 1.6	1.6: black Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 2 hazard: Gases						
2.1	Flammable gases (except as provided for in 5.2.2.2.1.6 d))	Flame: black or white	Red	2 (black or white)		-
2.2	Non-flammable, non-toxic gases	Gas cylinder: black or white	Green	2 (black or white)		-
2.3	Toxic gases	Skull and crossbones: black	White	2 (black)		-

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 3 hazard: Flammable liquids						
3	-	Flame: black or white	Red	3 (black or white)		-
Class 4.1 hazard: Flammable solids, self-reactive substances, solid desensitized explosives and polymerizing substances						
4.1	-	Flame: black	White with 7 vertical red stripes	4 (black)		-
Class 4.2 hazard: Substances liable to spontaneous combustion						
4.2	-	Flame: black	Upper half white, lower half red	4 (black)		-
Class 4.3 hazard: Substances which, in contact with water emit flammable gases						
4.3	-	Flame: black or white	Blue	4 (black or white)		-

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 5.1 hazard: Oxidizing substances						
5.1	-	Flame over circle: black	Yellow	5.1 (black)		-
Class 5.2 hazard: Organic peroxides						
5.2	-	Flame: black or white	Upper half red, lower half yellow	5.2 (black)		-
Class 6.1 hazard: Toxic substances						
6.1	-	Skull and crossbones: black	White	6 (black)		-
Class 6.2 hazard: Infectious substances						
6.2	-	Three crescents superimposed on a circle: black	White	6 (black)		The lower half of the label may bear the inscriptions: "INFECTIOUS SUBSTANCE" and "In the case of damage or leakage immediately notify Public Health Authority" in black colour

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 7 hazard: Radioactive material						
7A	Category I – WHITE	Trefoil: black	White	7 (black)		Text (mandatory), black in lower half of label: "RADIOACTIVE" "CONTENTS ..." "ACTIVITY ..." One red vertical bar shall follow the word: "RADIOACTIVE"
7B	Category II – YELLOW	Trefoil: black	Upper half yellow with white border, lower half white	7 (black)		Text (mandatory), black in lower half of label: "RADIOACTIVE" "CONTENTS ..." "ACTIVITY ..." In a black outlined box: "TRANSPORT INDEX"; Two red vertical bars shall follow the word: "RADIOACTIVE"
7C	Category III – YELLOW	Trefoil: black	Upper half yellow with white border, lower half white	7 (black)		Text (mandatory), black in lower half of label: "RADIOACTIVE" "CONTENTS ..." "ACTIVITY ..." In a black outlined box: "TRANSPORT INDEX". Three red vertical bars shall follow the word: "RADIOACTIVE"
7E	Fissile material	-	White	7 (black)		Text (mandatory): black in upper half of label: "FISSILE"; In a black outlined box in the lower half of label: "CRITICALITY SAFETY INDEX"

Label model No.	Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 8 hazard: Corrosive substances						
8	-	Liquids, spilling from two glass vessels and attacking a hand and a metal: black	Upper half white, lower half black with white border	8 (white)		-
Class 9 hazard: Miscellaneous dangerous substances and articles, including environmentally hazardous substances						
9	-	7 vertical stripes in upper half: black	White	9 underlined (black)		-
9A	-	7 vertical stripes in upper half: black; battery group, one broken and emitting flame in lower half: black	White	9 underlined (black)		-

Chapter 5.3

5.3 In the title, after "CONTAINERS", insert ", BULK CONTAINERS".

5.3 After the heading, renumber the Note as Note 1 and after "containers," insert "bulk containers,". Add the following new Note 2:

"***NOTE 2:*** *In accordance with the GHS, a GHS pictogram not required by ADN should only appear in carriage as part of a complete GHS label and not independently (see GHS 1.4.10.4.4).*"

5.3.1.1.1 In the first sentence, after "containers", insert ", bulk containers". In the second sentence, after "container", insert ", bulk container".

5.3.1.1.1 At the end, add: "The placards shall be weather-resistant and shall ensure durable marking throughout the entire journey.".

5.3.1.1.3 In the first paragraph, replace "risk" by "hazard".

5.3.1.1.5 Replace "risk" by "hazard" (twice).

5.3.1.2 In the title, after "containers", insert ", bulk containers". In the paragraph after the Note, at the end, add "and to two opposites sides of the bulk container".

5.3.1.3 In the title, after "containers", insert ", bulk containers". In the paragraph after the Note, after "containers" , insert ", bulk containers".

5.3.2.1.4 Replace "transport units" by "vehicles" and "transport unit" by "vehicle" wherever it appears.

5.3.2.1.4 In the first sentence, replace "and containers" by ", containers and bulk containers" and replace "or container" by ", container or bulk container". In the second sentence, replace "or in the container" (first occurrence) by ", in the container or in the bulk container".

5.3.2.1.5 After "containers", insert ", bulk containers".

5.3.2.3.2 For hazard identification number 20, replace "risk" by "hazard".

5.3.3 Add the following sentence at the end of the second paragraph: "The mark shall be weather-resistant and shall ensure durable marking throughout the entire journey.".

5.3.6.1 and 5.3.6.2 After "containers", insert ", bulk containers".

5.3.6.1 Add the following new sentence at the end: "This does not apply to the exceptions listed in 5.2.1.8.1".

Chapter 5.4

5.4.1.1.1 (c) In the Note, replace "risk" by "hazard".

5.4.1.1.1 (d) In the Note, replace "risk" by "hazard".

5.4.1.1.5 In the heading and the following sentence, after "salvage packagings" add ", including large salvage packagings,".

5.4.1.1.6.2.1 (b) In the first paragraph replace "risk(s)" by "hazard(s)". In the second paragraph, replace "risk" by "hazard".

5.4.1.1.15 Replace "2.2.41.1.17" by "7.1.7".

5.4.1.1.19 In the first paragraph replace "risk(s)" by "hazard(s)". In the second paragraph, replace "risk" by "hazard".

5.4.1.2.3.1 Replace "2.2.52.1.15 to 2.2.52.1.17" by "2.2.52.1.15".

5.4.1.2.5.1 (b) In the last sentence, replace "risk" by "hazard".

5.4.3 INSTRUCTIONS IN WRITING ACCORDING TO ADN — Action to take in the event of an accident or incident

Amend the second indent to read as follows:

"Avoid sources of ignition, in particular, do not smoke, use electronic cigarettes or similar devices or switch on or off any electrical equipment or installation that does not meet the requirements for use in zone 1 (that means no installations or equipment marked in red according to 9.1.0.52.1, 9.3.1.52.2, 9.3.2.52.2 or 9.3.3.52.2) and is not designed for use in emergency response.".

Chapter 7.1

7.1.2.19.1 Amend the second paragraph to read as follows after the colon:

"1.16.1.1, 1.16.1.2, 1.16.1.3, 1.16.1.4, 7.1.2.5, 8.1.4, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 8.3.5, 9.1.0.0, 9.1.0.12.3, 9.1.0.12.4, 9.1.0.17.2, 9.1.0.17.3, 9.1.0.31, 9.1.0.32.2, 9.1.0.34, 9.1.0.40.2, 9.1.0.41, 9.1.0.51, 9.1.0.52, 9.1.0.71 and 9.1.0.74.".

7.1.3.1 Amend paragraphs 7.1.3.1.3 to 7.1.3.1.7 to read as follows:

"7.1.3.1.3 If the concentration of gases and vapours given off by the cargo or the oxygen content of the air in holds, double-wall spaces or double bottoms has to be measured before entry, the results of these measurements shall be recorded in writing. The measurement may only be effected by an expert referred to in 8.2.1.2, equipped with suitable breathing apparatus for the substance carried.

Entry into the spaces is not permitted for the purpose of measuring.

7.1.3.1.4 Carriage of cargo in bulk or without packaging

If a vessel carries dangerous goods in bulk or without packaging in its holds for which EX and/or TOX appears in column (9) of Table A of Chapter 3.2, the concentration of flammable and/or toxic gases and vapours given off by the cargo in these holds and adjacent holds shall be measured before any person enters these holds.

7.1.3.1.5 Entry into holds where dangerous goods are carried in bulk or without packaging as well as entry into double-hull spaces and double bottoms is only permitted if:

- The concentration of flammable gases and vapours given off by the cargo in the hold, double hull space or double bottom is below 10 % of the LEL, the concentration of toxic gases and vapours given off by the cargo is below national accepted exposure levels, and the percentage of oxygen is between 20 and 23.5 vol %; or
- The concentration of flammable gases and vapours given off by the cargo is below 10% of the LEL, and the person entering the space wears a self-contained breathing apparatus and other necessary protective and rescue equipment, and is secured by a line. Entry into these spaces is only permitted if this operation is supervised by a second person for whom the same equipment is readily at hand. Another two persons capable of giving assistance in an emergency shall be on the vessel within calling distance.

In deviation of 1.1.4.6, more stringent national legislation on the entry into holds shall take precedence over the ADN.

7.1.3.1.6 Carriage in packages

In case of suspected damage to packages, the concentration of flammable and/or toxic gases and vapours given off by the cargo in holds containing dangerous goods of Classes 2, 3, 4.3, 5.2, 6.1 and 8 for which EX and/or TOX appears in column (9) of Table A of Chapter 3.2, shall be measured before any person enters these holds.

7.1.3.1.7 Entry into holds where damage is suspected to packages in which dangerous goods of Classes 2, 3, 4.3, 5.2, 6.1 and 8 are carried as well as entry into double-hull spaces and double bottoms is only permitted if:

- The concentration of flammable gases and vapours given off by the cargo in the hold, double hull space or double bottom is below 10 % of the LEL, the concentration of toxic gases and vapours given off by the cargo is below national accepted exposure levels, and the percentage of oxygen is between 20 and 23,5 vol %; or
- The concentration of flammable gases and vapours given off by the cargo in the hold is below 10 % of the LEL and the person entering the space wears a self-contained breathing apparatus and other necessary protective and rescue equipment and is secured by a line. Entry into these spaces is only permitted if this operation is supervised by a second person for whom the same equipment is readily at hand. Another two persons capable of giving assistance in an emergency shall be on the vessel within calling distance.

In deviation of 1.1.4.6, more stringent national legislation on the entry into holds shall take precedence over the ADN.".

7.1.3 Add a new paragraph 7.1.3.16 to read as follows:

"7.1.3.16 All measurements on board the vessel shall be performed by an expert according to 8.2.1.2, unless provided otherwise in the Regulations annexed to ADN. The results of the measurements shall be recorded in writing in the book according to 8.1.2.1 (g).".

7.1.3 Replace "7.1.3.16 to 7.1.3.19 *(Reserved)*" by "7.1.3.17 to 7.1.3.19 *(Reserved)*".

7.1.3.31 Amend to read as follows:

"**7.1.3.31** ***Engines***

The use of engines running on fuels having a flashpoint equal to or lower than 55 °C (e.g. petrol engines) is prohibited. This provision does not apply to:

- the petrol-operated outboard motors of lifeboats;
- the propulsion and auxiliary systems which meet the requirements of Chapter 30 and Annex 8, Section 1 of the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) as amended*.

* *As available on the website of the Comité Européen pour l'Élaboration de Standards dans le Domaine de Navigation Intérieure – CESNI, https://www.cesni.eu/en/documents/es-trin/*

If a substance is carried in bulk and has in column (9) of Table A of Chapter 3.2 an entry "EX" then:

- Outboard motors and their fuel tanks shall be carried on board only outside the protected area; and
- Mechanical inflation devices, outboard motors and their electrical installations shall be put into operation only outside the protected area.".

7.1.3.41 Amend the heading to read as follows: "Smoking, fire or naked light".

7.1.3.41.1 Amend to read as follows:

"7.1.3.41.1 Smoking, including electronic cigarettes and other similar devices, fire and naked light are prohibited on board the vessel.

This prohibition shall be displayed on notice boards at appropriate places.

The prohibition does not apply in the accommodation or the wheelhouse, provided that their windows, doors, skylights and hatches are closed or the ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa.".

7.1.3.51 Amend the heading to read as follows: "Electrical and non-electrical installations and equipment".

7.1.3.51.1 Replace "Electrical installations" by "Electrical and non-electrical installations and equipment". The second amendment does not apply to the English text.

7.1.3.51.2 Amend to read as follows:

"The use of movable electric cables is prohibited in the protected area. This provision does not apply to the electric cables referred to in 9.1.0.53.5.

Movable electric cables must undergo visual inspection each time before use. They must be installed in such a way as to ensure that they are not at risk of damage. Connectors must be located outside of the protected area.

The use of electric cables to connect the power network of a vessel to a land-based power network is not permitted:

- During the loading or unloading of substances that have an entry "EX" in column (9) of Table A of Chapter 3.2; or
- When the vessel is located immediately adjacent to or within an onshore assigned zone.".

7.1.3.51.3 Amend the final sentence to read as follows: "Connecting or disconnecting shall only be possible when the sockets are not live.".

7.1.3.51.4 Amend to read as follows:

"7.1.3.51.4 The electrical installations and equipment in the holds shall be kept switched off and protected against unintentional connection.

This provision does not apply to permanently installed electrical cables passing through the holds, to movable electrical cables connecting containers stowed according to 7.1.4.4.4, or to electrical installations and equipment fulfilling the requirements for use in zone 1.".

7.1.3.51 Insert the following new paragraphs:

"7.1.3.51.5 During a stay in the immediate vicinity of or within an onshore assigned zone, electrical and non-electrical installations and equipment not fulfilling the requirements of 9.1.0.52.1 or that may have a surface temperature higher than 200 °C (marked in red according to 9.1.0.51 and 9.1.0.52.2) shall be switched off and cooled down to below 200 °C, or the measures mentioned in 7.1.3.51.6 shall be taken.

7.1.3.51.6 7.1.3.51.5 does not apply in accommodation, wheelhouse and service spaces located outside the protected area if:

(a) The ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa; and

(b) The gas detection system is switched on, taking measurements continuously.

7.1.3.51.7 Installations and equipment referred to in 7.1.3.51.5 that have been switched off during loading or unloading or during a stay in the immediate vicinity of or within an onshore assigned zone may only be switched on again when:

(a) The vessel is no longer in the vicinity of or within the onshore assigned zone; or

(b) A concentration of less than 10 % of the LEL of n-Hexane is reached in the wheelhouse, accommodation and service spaces located outside the protected area.

The results of the measurements shall be recorded in writing.

7.1.3.51.8 If vessels are not able to meet the requirements of 7.1.3.51.5 and 7.1.3.51.6, they are not permitted to remain in the immediate vicinity of or within an onshore assigned zone. The competent authority may allow exceptions in individual cases.".

7.1.4.1.4 Replace "smallest maximum net mass" by "smallest maximum mass".

7.1.4.1.5 Delete and insert "*(Deleted)*".

7.1.4.3.4 Amend table note 1 to read as follows:

"1 Packages containing articles assigned to compatibility group B or substances or articles assigned to compatibility group D may be loaded together in the same hold provided that they are carried in closed containers, vehicles or wagons.".

7.1.4.4.2 Amend the first indent to read as follows: "- closed containers;".

7.1.4.4.2 In the second indent, delete "with complete metal walls".

7.1.4.4.4 In the introductory sentence:

- Replace "The electrical equipment fitted to the outside of a closed container may be connected" by "The electrical installations and equipment fitted to the outside of a closed container may be connected".
- Replace "9.1.0.56" by "9.1.0.53.5".
- Replace "and be put into operation provided that:" by "or be put into operation provided that:".

7.1.4.4.4 (a) Amend to read as follows:

"(a) These electrical installations and equipment are appropriate at least for use in zone 1 and comply with the requirements for temperature class T4 and explosion group II B; or that".

7.1.4.4.4 (b) Amend the text before the indents as follows: "(b) These electrical installations and equipment do not fulfil the requirements referred to in (a), but are sufficiently separated from other containers containing substances of:".

- In the sentence after the indents, replace "of 2.4 m around the electrical equipment" by "of 2.40 m around the electrical installations and equipment".

7.1.4.4.4 Amend the sentence before "Examples of stowage and segregation of containers" to read as follows:

"The requirements of subparagraphs (a) and (b) need not be complied with if containers with the electrical installations or equipment which do not meet the requirements for use in

explosion hazardous areas and the containers containing the above-mentioned substances are stowed in separate holds.".

7.1.4.4.5 Amend to read as follows:

"7.1.4.4.5 Electrical installations and equipment fitted on an open container may not be connected with removable electrical cables in accordance with the provisions of 9.1.0.53.5 or be used unless they are appropriate at least for use in zone 1 and they comply with the requirements for temperature class T4 and explosion group II B, or the container is loaded in a hold free of containers containing substances mentioned in 7.1.4.4.4 (b).".

7.1.4.7.3 Add the following new paragraph:

"7.1.4.7.3 If a zone is assigned onshore at the loading or unloading station, the vessel is only authorized to stay in its immediate vicinity or within the zone if it meets the requirements of 9.1.0.12.3 (b) or (c), 9.1.0.51, 9.1.0.52.1 and 9.1.0.52.2. The competent authority may allow exceptions in individual cases.".

7.1.4.12.2 Amend the last sentence to read as follows: "Where damage of the container or release of content inside the container is suspected, the holds shall be ventilated so as to reduce the concentration of flammable gases and vapours given off by the cargo to less than 10 % of the LEL or in the case of toxic gases and vapours to below national accepted exposure levels.".

7.1.4.14.4 Amend the first indent to read "- closed containers;". Amend the third indent to read "- sheeted vehicles or sheeted wagons;".

7.1.4.53 Amend the final sentence to read as follows: "Where these lamps are positioned on deck in zone 2, they must conform to the requirements for use in zone 2.".

7.1.4.75 Amend to read as follows:

"7.1.4.75 Risk of sparking

All electrically continuous connections between the vessel and the shore shall be so designed that they do not present a source of ignition. If substances are carried that have in column (9) of Table A of Chapter 3.2 an entry "EX", then taking off clothes not sufficiently dissipative shall be prohibited in the protected area.".

7.1.5.3 Amend to read as follows: "Vessels shall be moored securely, but in such a way that they can be released quickly in an emergency and that the electric cables are not compressed, folded or subject to tensile strain.".

7.1.5.4.1 Amend to read as follows:

"The distances to be kept by vessels carrying dangerous goods at berth from other vessels shall not be less than the distance prescribed by the Regulations referred to in 1.1.4.6.".

7.1.6.12, VE01 In the first sentence, replace "concentration of gases" by "concentration of flammable gases and vapours" and "lower explosive limit" by "LEL". Amend the third sentence to read as follows: "A control measurement shall be repeated after one hour.".

7.1.6.12, VE02 In the first sentence, replace "free from gases" by "free from toxic gases and vapours". Amend the third sentence to read as follows: "A control measurement shall be repeated after one hour.". In the penultimate sentence, replace "free of gas" by "free of toxic gases and vapours given off by the cargo".

7.1.6.12, VE03 Amend the third sentence to read as follows: "After ventilation, the concentration of flammable or toxic gases and vapours given off by the cargo in these holds shall be measured.".

7.1.6.16, IN01 Amend to read as follows:

"IN01 After loading and unloading of these substances in bulk or unpackaged and before leaving the cargo transfer site, the concentration of flammable gases and vapours given off by the cargo in the accommodation, engine rooms and adjacent holds shall be measured by the loader or unloader or by an expert according to 8.2.1.2 using a gas detector. The results of the measurement shall be recorded in writing.

Before any person enters a hold and prior to unloading, the concentration of flammable gases and vapours given off by the cargo shall be measured by the unloader of the cargo or by an expert according to 8.2.1.2. The results of the measurement shall be recorded in writing.

The hold shall not be entered or unloading started until the concentration of flammable gases and vapours given off by the cargo in the airspace above the cargo is below 50 % of the LEL.

If the concentrations of flammable gases and vapours given off by the cargo is not below 50 % of the LEL safety measures shall be taken immediately by the loader, the unloader or the responsible master.".

7.1.6.16, IN02 Replace "gas concentration" by "concentration of toxic gases and vapours given off by the cargo".

Chapter 7.2

7.2.2.0 In NOTE 1, delete "or high velocity vent valves".

7.2.2.6 Amend to read as follows:

"**7.2.2.6** ***Gas detection system***

When the list of substances on the vessel according to 1.16.1 2.5 contains substances for which n-Hexane is not representative, the gas detection system shall also be calibrated in addition according to the most critical LEL of the substances accepted for carriage on the vessel.".

7.2.2.19.3 Amend the paragraph after the colon to read as follows:

"... :1.16.1.1, 1.16.1.2, 1.16.1.3, 1.16.1.4, 7.2.2.5, 8.1.4, 8.1.5, 8.1.6.1, 8.1.6.3, 8.1.7, 8.3.5, 9.3.3.0.1, 9.3.3.0.3 (d), 9.3.3.0.5, 9.3.3.10.1, 9.3.3.10.2, 9.3.3.10.5, 9.3.3.12.4, 9.3.3.12.6, 9.3.3.16.1, 9.3.3.16.2, 9.3.3.17.1 to 9.3.3.17.4, 9.3.3.31.1 to 9.3.3.31.5, 9.3.3.32.2, 9.3.3.34.1, 9.3.3.34.2, 9.3.3.40.1, (however, one single fire or ballast pump shall be sufficient), 9.3.3.40.2, 9.3.3.41, 9.3.3.51, 9.3.3.52.1 to 9.3.3.52.8, 9.3.3.71 and 9.3.3.74.".

7.2.2.19.3 Amend final paragraph to read as follows:

"Vessels used only to move tank vessels where the list of substances on the vessel according to 1.16.1.2.5 contains only substances for which explosion protection is not required do not have to meet the requirements of 9.3.3.10.1, 9.3.3.10.5, 9.3.3.12.6, 9.3.3.51 and 9.3.3.52.1. In this case the following entry shall be made in the certificate of approval or provisional certificate of approval under number 5, permitted derogations: 'Derogation from 9.3.3.10.1, 9.3.3.10.5, 9.3.3.12.6, 9.3.3.51 and 9.3.3.52.1; the vessel may only move tank vessels where the list of substances on the vessel according to 1.16.1.2.5 contains only substances for which explosion protection is not required'.".

7.2.2.19.4 Add the following new paragraph:

"7.2.2.19.4 During loading and unloading of substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, only installations and equipment that meet

the requirements of 9.3.3.53 may be used on the deck of other vessels of the convoy. This condition shall not apply to:

(a) Installations and equipment of vessels linked fore or aft of the vessel which is being loaded or unloaded, if the tank vessel being loaded or unloaded is equipped with a protective wall at the respective end of the cargo area or located at a distance of at least 12.00 m from the boundary plane of the cargo area of the vessel being loaded or unloaded.

(b) Installations and equipment of tank vessels coupled side-by-side with the vessel being loaded or unloaded, if such installations or equipment are positioned behind a protective wall according to 9.3.3.10.3 and the protective wall is not next to the cargo area of the vessel being loaded or unloaded, or located at a distance of at least 12.00 m from the boundary plane of the cargo area of the vessel being loaded or unloaded.".

7.2.2.21 Replace "quick action stop valve" by "quick closing valve".

7.2.2.22 Delete and insert "*(Deleted)*".

7.2.3.1.4 Amend the beginning of the first paragraph to read as follows: "When the concentration of flammable or toxic gases and vapours given off by the cargo or the oxygen content has to be measured...", remainder unchanged. In the second paragraph, replace "persons" by "an expert referred to in 8.2.1.2".

7.2.3.1.5 Amend to read as follows:

"7.2.3.1.5 Before any person enters cargo tanks, the residual cargo tanks, the cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms, hold spaces or other confined spaces:

(a) When dangerous substances of Classes 2, 3, 4.1, 6.1, 8 or 9 for which a gas detector is required in column (18) of Table C of Chapter 3.2 are carried on board the vessel, it shall be established, by means of this device that the concentration of flammable gases and vapours given off by the cargo in these cargo tanks, residual cargo tanks, cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms, or hold spaces is not more than 50% of the LEL. For the cargo pump-rooms below deck this may be determined by means of the permanent gas detection system;

(b) When dangerous substances of Classes 2, 3, 4.1, 6.1, 8 or 9 for which a toximeter is required in column (18) of Table C of Chapter 3.2 are carried on board the vessel, it shall be established, by means of this device that the cargo tanks, residual cargo tanks, cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms or hold spaces do not contain concentration of toxic gases and vapours given off by the cargo which exceeds national accepted exposure levels.

In deviation of 1.1.4.6, more stringent national legislation on the entry into holds shall take precedence over the ADN.".

7.2.3.1.6 Amend to read as follows:

"7.2.3.1.6 Entry into empty cargo tanks, the residual cargo tanks, the cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms, hold spaces or other confined spaces is only permitted if:

- The concentration of flammable gases and vapours given off by the cargo in the cargo tanks, the residual cargo tanks, the cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms, hold spaces or other confined spaces, is below 10 % of the LEL, the

concentration of toxic gases and vapours given off by the cargo is below national accepted exposure levels, and the percentage of oxygen is between 20 and 23,5 vol %; or

- The concentration of flammable gases and vapours given off by the cargo in the cargo tanks, the residual cargo tank, the cargo pump-rooms below deck, cofferdams, double-hull spaces, double bottoms, hold spaces or other confined spaces, is below 10 % of the LEL, and the person entering the spaces wears a self-contained breathing apparatus and other necessary protective and rescue equipment, and is secured by a line. Entry into these spaces is only permitted if this operation is supervised by a second person for whom the same equipment is readily at hand. Another two persons capable of giving assistance in an emergency shall be on the vessel within calling distance. If a rescue winch has been installed, only one other person is sufficient.

  In case of emergency or mechanical problems, it is allowed to enter the tank when the concentration of flammable gases and vapours given off by cargo is between 10 and 50 % of the LEL. The breathing apparatus (self-contained) in use has to be designed in such a way that the causing of sparks is avoided.

In deviation of 1.1.4.6, more stringent national legislation on the entry into cargo tanks shall take precedence over the ADN.".

7.2.3.6 Amend to read as follows:

"**7.2.3.6** ***Gas detection system***

The gas detection system shall be maintained and calibrated by trained and qualified personnel in accordance with the instructions of the manufacturer.".

7.2.3.7 Amend 7.2.3.7 (title) and 7.2.3.7.0 to 7.2.3.7.2 to read as follows:

"**7.2.3.7** ***Degassing of empty or unloaded cargo tanks and piping for loading and unloading***

7.2.3.7.0 Degassing of empty or unloaded cargo tanks and piping for loading and unloading into the atmosphere or to reception facilities is permitted under the conditions below but only if and insofar it is not prohibited on the basis of other legal requirements.

7.2.3.7.1 Degassing of empty or unloaded cargo tanks and piping for loading and unloading into the atmosphere

7.2.3.7.1.1 Empty or unloaded cargo tanks having previously contained dangerous substances of:

- Class 2 or Class 3, with a classification code including the letter "T" in column (3b) of Table C of Chapter 3.2;
- Class 6.1; or
- Packing group I of Class 8;

may only be degassed by an expert according to 8.2.1.2. This may be carried out only at the locations approved by the competent authority.

7.2.3.7.1.2 Where degassing of cargo tanks having previously contained the dangerous goods referred to in 7.2.3.7.1.1 above is not practicable at the locations

approved for this purpose by the competent authority, degassing may be carried out while the vessel is under way, provided that:

- The requirements of the first paragraph of 7.2.3.7.1.3 are complied with; the concentration of flammable gases and vapours given off by the cargo in the vented mixture at the outlet shall, however, be not more than 10 % of the LEL;
- The crew is not exposed to a concentration of gases and vapours which exceeds national accepted exposure levels;

7.2.3.7.1.3 Degassing of empty or unloaded cargo tanks having contained dangerous goods other than those referred to under 7.2.3.7.1.1, when the concentration of flammable gases and vapours given off by the cargo is 10 % of the LEL or above, may be carried out while the vessel is underway or at locations approved by the competent authority by means of suitable venting equipment with the tank lids closed and by leading the gas/air mixtures through flame-arresters capable of withstanding steady burning (Explosion group / subgroup according to column (16) of Table C, Chapter 3.2). The concentration of flammable gases and vapours in the vented mixture at the outlet shall be less than 50 % of the LEL. The suitable venting equipment may be used for degassing by extraction only when a flame-arrester is fitted immediately before the ventilation fan on the extraction side (Explosion group /subgroup according to column (16) of Table C, Chapter 3.2). The concentration of flammable gases and vapours shall be measured once each hour during the two first hours after the beginning of the degassing operation by forced ventilation or by extraction, by an expert referred to in 8.2.1.2. The results of these measurements shall be recorded in writing.

Degassing is, however, prohibited within the area of locks including their lay-bys, under bridges or within densely populated areas.

Degassing of empty or unloaded cargo tanks having contained dangerous goods other than those referred to in 7.2.3.7.1.1, when the concentration of gases and vapours given off by the cargo is below 10 % of the LEL, is allowed, and also additional openings of the cargo tank are allowed to be opened as long as the crew is not exposed to a concentration of gases and vapour which exceeds national accepted exposure levels. Also, there is no obligation to use a flame arrester.

It is prohibited within the area of locks, including their lay-bys, under bridges or within densely populated areas.

7.2.3.7.1.4 Degassing operations shall be interrupted during a thunderstorm or when, due to unfavourable wind conditions, dangerous concentrations of flammable or toxic gases and vapours are to be expected outside the cargo area in front of the accommodation, the wheelhouse and service spaces. The critical state is reached as soon as concentrations given off by the cargo of flammable gases and vapours of more than 20 % of the LEL or of toxic gases and vapours exceeding the national accepted exposure levels have been detected in those areas by measurements by means of portable measurement devices.

7.2.3.7.1.5 The marking prescribed in 7.2.5.0.1 may be withdrawn by order of the master when, after degassing of the cargo tanks, it has been ascertained, using the equipment described in column (18) of Table C of Chapter 3.2, that none of the cargo tanks contain flammable gases and vapours in concentrations of more than 20 % of the LEL or contain a concentration of toxic gases and vapours

which exceeds national accepted exposure levels. The result of the measurement shall be recorded in writing.

7.2.3.7.1.6 Before taking measures which could cause hazards as described in 8.3.5, all cargo tanks and pipes in the cargo area shall be made gas-free. This shall be documented in a gas-free certificate, valid on the day the works commence. The condition of being gas-free may only be declared and certified by a person approved by the competent authority.

7.2.3.7.2 Degassing of empty or unloaded cargo tanks and piping for loading and unloading to reception facilities

7.2.3.7.2.1 Empty or unloaded cargo tanks may only be degassed by an expert according to 8.2.1.2. If required by international or national law, it may only be carried out at the locations approved by the competent authority. Degassing to a mobile reception facility while the vessel is underway, is prohibited. Degassing to a mobile reception facility is prohibited while another vessel degasses to the same facility. Degassing to an on board mobile reception facility is prohibited.

7.2.3.7.2.2 Before the degassing operation commences, the degassing vessel shall be earthed. The master of the degassing vessel or an expert according to 8.2.1.2 mandated by him and the operator of the reception facility shall have filled in and signed a checklist confirming with 8.6.4 of ADN.

The checklist shall be printed at least in languages understood by the master or the expert and the operator of the reception facility.

If a positive response to all the questions is not possible, degassing to a reception facility is only permitted with the consent of the competent authority.

7.2.3.7.2.3 Degassing to reception facilities may be carried out by using the piping for loading and unloading or the venting piping to remove the gases and vapours from the cargo tanks while using the other piping respectively to prevent exceedance of the maximum permissible overpressure or vacuum of the cargo tanks.

Piping shall be part of a closed system or, if used to prevent exceedance of the maximum permissible vacuum in the cargo tanks, be equipped with a permanently installed or portable spring-loaded low-pressure valve, with a flame-arrester (Explosion group/subgroup according to column (16) of Table C of Chapter 3.2) if explosion protection is required (column (17) of Table C of Chapter 3.2). This low-pressure valve shall be so installed that under normal working conditions the vacuum valve is not activated. A permanently installed valve or the opening to which a portable valve is connected, must remain closed with a blind flange when the vessel is not degassing to a reception facility.

All piping connected between the degassing vessel and the reception facility shall be equipped with an appropriate flame arrester if explosion protection is required in column (17) of Table C of Chapter 3.2. The requirements for piping on board shall be: Explosion group/subgroup according to column (16) of Table C of Chapter 3.2.

7.2.3.7.2.4 It shall be possible to interrupt degassing operations by means of switches installed at two locations on the vessel (fore and aft) and at two locations at the reception facility (directly at the access to the vessel and at the location from where the reception facility is operated). Interruption of degassing shall be effected by the means of a quick closing valve which shall be directly fitted in

the connection between the degassing vessel and the reception facility. The system of disconnection shall be designed in accordance with the closed circuit principle and may be integrated in the emergency shutdown system of the cargo pumps and overfill protections prescribed in 9.3.1.21.5, 9.3.2.21.5 and 9.3.3.21.5.

Degassing operations shall be interrupted during a thunderstorm.

7.2.3.7.2.5 The marking prescribed in column (19) of Table C of Chapter 3.2 may be withdrawn by order of the master when, after degassing of the cargo tanks, it has been ascertained, using the equipment described in column (18) of Table C of Chapter 3.2, that none of the cargo tanks contain flammable gases and vapours in concentrations of more than 20 % of the LEL or contain a concentration of toxic gases and vapours which exceeds national accepted exposure levels. The result of the measurement shall be recorded in writing.

7.2.3.7.2.6 Before taking measures which could cause hazards as described in 8.3.5, all cargo tanks and pipes in the cargo area shall be made gas-free. This shall be documented in a gas-free certificate, valid on the day the works commence. The condition of being gas-free may only be declared and certified by a person approved by the competent authority.".

7.2.3.12.2 In the second indent, replace "gas -freeing" by "degasing".

7.2.3 Add a new paragraph 7.2.3.16 to read as follows:

"7.2.3.16 All measurements on board the vessel shall be performed by an expert according to 8.2.1.2, unless provided otherwise in the Regulations annexed to ADN. The results of the measurements shall be recorded in writing in the book according to 8.1.2.1 (g).".

7.2.3 Replace "7.2.3.16 to 7.2.3.19 *(Reserved)*" by "7.2.3.17 to 7.2.3.19 *(Reserved)*".

7.2.3.29.1 Add at the end:

"If the vessel substance list according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2,

- Outboard motors and their fuel tanks shall be carried on board only outside the cargo area; and
- Mechanical inflation devices, outboard motors and their electrical installations shall be put into operation only outside the cargo area.".

7.2.3.31.1 Amend to read as follows:

"The use of engines running on fuels having a flashpoint equal to or lower than 55 °C (e.g. petrol engines) is prohibited. This provision does not apply to:

- the petrol-operated outboard motors of lifeboats;
- the propulsion and auxiliary systems which meet the requirements of Chapter 30 and Annex 8, Section 1 of the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) as amended*.".

7.2.3.41 Amend the heading to read as follows: "Smoking, fire or naked light".

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* *As available on the website of the Comité Européen pour l'Élaboration de Standards dans le Domaine de Navigation Intérieure – CESNI, https://www.cesni.eu/en/documents/es-trin/*

7.2.3.41.1 Amend to read as follows:

"Smoking, including electronic cigarettes and other similar devices, fire and naked light are prohibited on board the vessel.

This prohibition shall be displayed on notice boards at appropriate places.

The prohibition on smoking does not apply in the accommodation or the wheelhouse, provided that their windows, doors, skylights and hatches are closed or the ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa.".

7.2.3.44 Replace "cargo area" by "explosion hazardous area".

7.2.3.51 Amend the heading to read as follows: "Electrical and non-electrical installations and equipment".

7.2.3.51.1 Replace "Electrical installations" by "Electrical and non-electrical installations and equipment". The second amendment does not apply to the English text.

7.2.3.51.2 Amend to read as follows:

"7.2.3.51.2 The use of movable electric cables is prohibited in the explosion hazardous area. This provision does not apply to the movable electric cables referred to in 9.3.1.53.3, 9.3.2.53.3, and 9.3.3.53.3.

Movable electric cables must undergo visual inspection each time before use. They must be installed in such a way as to ensure that they are not at risk of damage. Connectors must be located outside of the explosion danger area.

The use of electric cables to connect the power network of a vessel to a land-based power network is not permitted:

- During the loading or unloading of substances for which explosion protection is required in column (17) of Table C of Chapter 3.2; or
- When the vessel is located immediately adjacent to or within an onshore assigned zone.".

7.2.3.51.3 Amendment does not apply to the English text.

7.2.3.51 Insert the following new paragraphs:

"7.2.3.51.4 During a stay in the immediate vicinity of or within an onshore assigned zone, electrical and non-electrical installations and equipment not complying with the requirements of 9.3.x.51 (a), 9.3.x.51 (b), 9.3.x.51 (c) or 9.3.x.52.1 (marked in red according to 9.3.x.51 and 9.3.x.52.3) shall be switched off, cooled down to below the temperature mentioned in 9.3.x.51 (a) or 9.3.x.51 (b), or the measures mentioned in 7.2.3.51.6 shall be taken.

When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, this provision applies also during loading and unloading and gas-freeing during berthing.

7.2.3.51.5 When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which the temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6), respectively.

7.2.3.51.6 7.2.3.51.4 and 7.2.3.51.5 do not apply in the accommodation, the wheelhouse or service spaces located outside the cargo area if:

(a) The ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa; and

(b) The gas detection system is switched on, taking measurements continuously.

7.2.3.51.7 Installations and equipment according to 7.2.3.51.4 that have been switched off during loading and unloading, gas-freeing during berthing or a stay in the vicinity of or within an onshore assigned zone may only be switched on again:

- Once the vessel is no longer in the vicinity of or within the onshore assigned zone; or
- When values corresponding to 10 % of the LEL of n-Hexane or 10 % of the LEL of the cargo, whichever is the more critical, are reached in the wheelhouse, accommodation and service spaces located outside the cargo area.

The results of the measurements shall be recorded in writing.

7.2.3.51.8 If vessels are not able to meet the requirements of 7.2.3.51.4 and 7.2.3.51.6, they are not permitted to remain in the immediate vicinity of or within an onshore assigned zone.".

7.2.4.1.1 Amend the first indent to read as follows: "

- residual cargo, washing water, cargo residues and slops contained in no more than six approved receptacles for residual products and receptacles for slops having a maximum total capacity of not more than 12 m³. The receptacles for residual products and the receptacles for slops shall be properly secured in the cargo area, be located at a minimum distance from the hull equal to one quarter of the vessel's breadth and comply with the provisions of 9.3.2.26.3 or 9.3.3.26.3 concerning them.".

7.2.4.2.2 In the first sentence, replace "The landing" by "Mooring" and "gas -freeing" by "degasing".

7.2.4.2.3 In the first sentence, replace "Berthing" by "Mooring" and "gas-freeing" by "degasing".

7.2.4.7.1 Replace "loaded, unloaded or gas-freed" by "loaded or unloaded".

7.2.4.7.1 At the end, add:

"If a zone is assigned onshore at the loading or unloading station, the vessel is only authorized to stay in its immediate vicinity or within the zone if it meets the requirements of 9.3.x.12.4 (b) or (c), 9.3.x.51, 9.3.x.52.1 and 9.3.x.52.3. The competent authority may allow exceptions in individual cases.".

7.2.4.7.2 Amend to read as follows:

"7.2.4.7.2 The reception from other vessels of unpackaged oily and greasy liquid wastes resulting from the operation of vessels and the handing over of products for the operation of vessels into the bunkers of other vessels shall not be taken to be loading or unloading within the meaning of 7.2.4.7.1 above or transhipment within the meaning of 7.2.4.9.".

7.2.4.9 Renumber the existing note as NOTE 1. Add a new NOTE 2 to read as follows:

"***NOTE 2***: *This prohibition also applies to transhipment between supply vessels.*".

7.2.4.10.1 Delete the last paragraph.

7.2.4.12 In the fourth paragraph, replace "Gas-freeing" by "Degasing", twice.

7.2.4.13.1, third paragraph Replace "cargo residues" by "residues of previous cargo".

7.2.4.15.2 Amend to read as follows:

"During the filling of the residual tanks and receptacles for residual products, released gases shall be safely evacuated. They shall only be connected to the venting piping for the time necessary to fill them.

Capacity to collect any leaking liquids shall be placed under the connections used during filling.".

7.2.4.15.3 and 7.2.4.16.3 Replace "gas-freeing" by "degasing".

7.2.4.16.3 After "loading and unloading piping", insert "if available,".

7.2.4.16.6 Replace "at the connection point" by "at the connecting-point of the vapour return piping and the venting piping". Replace "high velocity vent valve" by "pressure relief device/high-velocity vent valve".

7.2.4.16.7 Amend to read as follows:

"When a tank vessel conforms to 9.3.2.22.4 (b) or 9.3.3.22.4 (b), the individual cargo tanks shall be closed off during carriage and opened during loading, unloading and degassing.".

7.2.4.16.8 Amend the second sentence to read as follows: "Persons connecting or disconnecting the loading and unloading piping or the venting piping, relieving pressure in cargo tanks, taking samples, carrying out measurements or cleaning or replacing the flame arrester plate stack (see 7.2.4.22), shall wear the PP equipment referred to in 8.1.5 if this equipment is prescribed in column (18) of Table C of Chapter 3.2; they shall also wear protective equipment A if a toximeter (TOX) is prescribed in column (18) of Table C of Chapter 3.2.".

7.2.4.16.12 At the end of the first sentence, delete the full stop and insert "(explosion group/subgroup according to column (16) of table C of Chapter 3.2).".

7.2.4.17.1 Amend as follows:

Amend the first paragraph to read as follows:

"During loading, unloading, gas-freeing operations, or a stay in the vicinity of or within an onshore assigned zone, all entrances or openings of spaces which are accessible from the deck and all openings of spaces facing the outside shall remain closed.".

In the penultimate indent of the second paragraph, replace "of the overpressure ventilation system" by "of the ventilation system".

In the penultimate indent of the second paragraph replace "9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3" by "9.3.1.12.4, 9.3.2.12.4 or 9.3.3.12.4".

Amend the last indent of the second paragraph to read as follows:

- "air intakes of air conditioning installations if these openings are fitted with a gas detection system referred to in 9.3.1.12.4, 9.3.2.12.4 or 9.3.3.12.4.".

7.2.4.17.1 and 7.2.4.17.2 Replace "gas-freeing" by "degasing".

7.2.4.22.1 At the end, add the following new paragraph:

"Pressure relief of cargo tanks is permitted only when using the device for safe pressure relief prescribed in 9.3.2.22.4 (a) and 9.3.2.22.4 (b) or 9.3.3.22.4 (a) and 9.3.3.22.4 (b). When explosion protection is required under column (17) of Table C of Chapter 3.2, the opening of cargo tank covers shall be permitted only if the cargo tanks in question have been degassed and the concentration of flammable gases in the tanks is less than 10 % of the lower explosive limit of the cargo/previous cargo. The results of the measurements shall be recorded in writing. Entry into these cargo tanks is not permitted for the purpose of measuring.".

7.2.4.22.2 Amend to read as follows:

"Opening of sampling outlets is only permitted for sampling and control or cleaning of empty cargo tanks.".

7.2.4.22.3 In the second sentence, delete: "and ullage openings".

7.2.4.22.5 Amend to read as follows:

"Opening of the housing of the flame arresters is permitted only for the cleaning of the flame arrester plate stack or replacement by flame arrester plate stacks of the same design.

Opening is permitted only when the relevant cargo tanks are empty and the concentration of flammable gases in the cargo tank is less than 10 % of the lower explosive limit of the cargo previous cargo.

The results of the measurements shall be recorded in writing.

Cleaning and replacing of the flame arrestor plate stack shall be carried out only by trained and qualified personnel.".

7.2.4.22.6 Amend to read as follows:

"For the operations referred to in 7.2.4.22.4 and 7.2.4.22.5, only low-sparking hand tools (e.g. chromium vanadium steel screwdrivers and wrenches) shall be used.".

7.2.4.22.7 Amend to read as follows:

"The duration of opening shall be limited to the time necessary for control, cleaning, replacing the flame arrester or sampling.".

7.2.4.22 Add the following new paragraph:

"7.2.4.22.8 The provisions of 7.2.4.22.1 to 7.2.4.22.7 above shall not apply to oil separator or supply vessels.".

7.2.4.25 Amend the heading to read as follows: "Loading and unloading piping and venting piping".

7.2.4.25.3 Delete and insert "*(Reserved)*".

7.2.4.25.5 Amend to read as follows:

"7.2.4.25.5 The gas/air mixtures released during loading operations shall be returned ashore through a vapour return piping if:

- A closed cargo tank is required according to column (7) of Table C of Chapter 3.2; or
- A closed cargo tank was required for the previous cargo in column (7) of Table C of Chapter 3.2 and before the loading the concentration of flammable gases of the previous cargo in the cargo tank is above 10% of the LEL or the cargo tank contains toxic gases, corrosive gases (packing group I or II) or gases with CMR-characteristics (Categories 1A or 1B) in a concentration above national accepted exposure levels, the results of these measurements shall be recorded in writing.

If the substance to be loaded requires explosion protection according to column (17) of Table C of Chapter 3.2, and the use of the vapour return piping is prescribed, the connection of the vapour return piping shall be designed such that the vessel is protected against detonations and the passage of flames from the shore. The protection of the vessel against detonations and the passage of flames from the shore is not required when the cargo tanks are inerted in accordance with 7.2.4.18.".

7.2.4.25 Add the following new paragraph:

"7.2.4.25.7 For connecting or disconnecting loading or unloading piping and venting piping, only low-sparking hand tools (e.g. chromium vanadium steel screwdrivers and wrenches) shall be used.".

7.2.4.28.2 Replace "high velocity vent valves" by "pressure relief devices/high-velocity vent valves".

7.2.4.41 Amend the heading to read as follows: "Smoking, fire or naked light".

Amend the first sentence to read as follows: "During loading, unloading or degassing operations, fires, naked lights, and smoking are prohibited on board the vessel".

7.2.4.51 Amend the heading to read as follows: "Electrical installations and equipment".

7.2.4.51.1 Delete and insert "*(Deleted)*".

7.2.4.51.2 Delete and insert "*(Deleted)*".

7.2.4.53 In the second sentence, replace "electric lamps" by "electrical lighting appliances" The second amendments do not apply to the English text. Delete the final sentence: "Where these lamps are positioned in the cargo area, they shall be of the certified safe type.".

7.2.4.60 Amendment does not apply to the English text.

7.2.4.74 Delete and insert "*(Deleted)*".

7.2.4.75 Amend to read as follows:

"7.2.4.75 Risk of sparking

All electrically continuous connections between the vessel and the shore shall be so designed that they do not present a source of ignition. If the vessel substance list as referred to in 1.16.1.2.5 includes substances that require anti-explosion protection in accordance with column (17) of Table C of Chapter 3.2, taking off clothes not sufficiently dissipative shall be prohibited in zone 1.".

Table 7.2.4.77 Amend the headings of the first and second columns under "Class" to read as follows:

"2, 3 (except second and third entries of UN No. 1202, packing group III, in Table C)".

"3 (only for the second and third entries of UN No. 1202, packing group III, in Table C), 4.1".

7.2.5.0.1 Amend the second sentence to read as follows: "When because of the cargo carried no marking with blue cones or blue lights is prescribed but the concentration of flammable or toxic gases and vapours in the cargo tanks, given off by the last cargo for which marking was required, is higher than 20% of the LEL or exceeds the national accepted exposure levels, the number of blue cones or blue lights to be carried is determined by the last cargo for which this marking was required.".

7.2.5.3 Amend to read as follows:

"7.2.5.3 Mooring

Vessels shall be moored securely, but in such a way that they can be released quickly in an emergency and the electric cables and hose assemblies are not compressed, folded or subject to tensile strain.".

Chapter 8.1

8.1.2.1 (e) Amend to read as follows:

"(e) The inspection certificate of the insulation resistance of the electrical installations prescribed in 8.1.7.1 and the certificates prescribed in 8.1.7.2 concerning the inspection of all installations, equipment and self-contained protection systems and the conformity of the documents required in 8.1.2.2 (e) to (h) and 8.1.2.3 (r) to (v) with the circumstances on board;".

8.1.2.1 (f) Amend to read as follows:

"(f) A certificate concerning the inspection of the fire-extinguishing hoses prescribed in 8.1.6.1 and a certificate concerning the inspection of the special equipment prescribed in 8.1.6.3;".

8.1.2.2 At the end, add the following new subparagraphs:

"(e) A list of or a general plan indicating the fixed installations and equipment suitable for use at least in zone 1 and the installations and equipment complying with 9.1.0.51;

(f) A list of or a general plan indicating the fixed installations and equipment which are not authorized for use during loading and unloading, during a stay near to or within an onshore assigned zone (marked in red according to 9.1.0.52.2);

(g) A plan indicating the boundaries of the zones and the location of the electrical and non-electrical equipment installed in the relevant zones intended for used in explosion hazardous areas;

(h) A list of the installations and equipment referred to under (g) with the following information:

- Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EU[2] or equivalent protection level, explosion group, temperature class, type of protection, test body) in case of electrical equipment for use in zone 1 (alternatively, a copy of the certificate of conformity according to Directive 2014/34/EU[2]);

- Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EU[2] or equivalent protection level, including explosion group and temperature class, type of protection, identification number) in case of electrical equipment for use in zone 2 and in the case of non-electrical equipment for use in zone 1 and zone 2 (alternatively, a copy of the certificate of conformity according to Directive 2014/34/EU[2]);

The documents listed above shall bear the stamp of the competent authority issuing the certificate of approval.".

8.1.2.3 (b) Replace "7.2.3.15" by "8.2.1.2".

8.1.2.3 (d) Delete and insert "*(Deleted)*".

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[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

8.1.2.3 (f) Amend to read as follows:

"(f) The certificates concerning the inspection of the special equipment, the gas detection systems and the oxygen measuring system prescribed in 8.1.6.3;".

8.1.2.3 (j) Amend to read as follows:

"(j) The inspection certificate of the cargo pump-rooms prescribed in 8.1.8;".

8.1.2.3 (l) Delete and insert *"(Deleted)."*.

8.1.2.3 (q) Amend to read as follows:

"(q) When carrying refrigerated liquefied gases and the temperature is not controlled in accordance with 9.3.1.24.1 (a) and 9.3.1.24.1 (c), the determination of the holding time (7.2.4.16.16, 7.2.4.16.17 and documentation on the heat transmission coefficient);".

8.1.2.3 Add the following new sub-paragraphs:

"(r) A list of or a general plan indicating the fixed installations and equipment suitable to be used at least in zone 1 and the installations and equipment complying with 9.3.x.51;

(s) A list of or a general plan indicating the fixed installations and equipment which are not authorized for use during loading and unloading, gas-freeing or during a stay near to or within an onshore assigned zone (marked in red according to 9.3.1.52.3, 9.3.2.52.3 or 9.3.3.52.3);

(t) A plan approved by a recognized classification society indicating the boundaries of the zones and the location of the electrical and non-electrical equipment installed in the relevant zone intended to be used in explosion hazardous areas, as well as self-contained protection systems;

(u) A list of the installations/equipment referred to under (t) and of the self-contained protection systems, with the following information:

- Installations/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EU[2] or at least equivalent), including explosion group and temperature class, type of protection and test body, in the case of electrical equipment for use in zone 0 or zone 1 and, in the case of non-electrical equipment for use in zone 0; (alternatively, a copy of the inspection certificate, for example the declaration of conformity under Directive 2014/34/EU[2]);
- Installation/equipment, location, marking (explosion protection level according to IEC 60079-0, equipment category according to Directive 2014/34/EU[2] or equivalent protection level, including explosion group and temperature class, type of protection, identification number) in the case of electrical equipment for use in zone 2 and in the case of non-electrical equipment for use in zone 1 and zone 2 (alternatively, a copy of the inspection certificate, for example, the certificate of conformity according to Directive 2014/34/EU[2]);
- Self-protection system, place of installation, marking (explosion group/subgroup):

[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*
[2] *Official Journal of the European Union No. L 96 of 29 March 2014, p. 309.*

(v) A list of or general plan indicating the fixed installations and equipment installed outside the explosion hazardous areas that may be used during loading, unloading, gas-freeing, berthing or during a stay in the immediate vicinity of or within an onshore assigned zone, if not referred to in (*r*) and (*u*).

The documents listed in (*r*) to (*v*) shall bear the stamp of the competent authority issuing the certificate of approval.".

(w) The certificates required under 3.2.3.1, Explanations concerning Table C, explanatory note for column (20), remark 12 subparagraphs (p) and (q), if appropriate;

(x) The certificates required under 3.2.3.1, Explanations concerning Table C, explanatory note for column (20), remark 33 subparagraphs (i), (n) and (o), if appropriate.".

8.1.5.1 Replace "EX: a flammable gas detector" by "EX: a gas detector".

8.1.5.1 Amend the entry for "TOX" to read as follows: "TOX: a toximeter appropriate for the current and previous cargo, with the accessories and instructions for its use;".

8.1.5.2 Amend to read as follows:

"8.1.5.2 For operations carried out in explosion hazardous areas or during stay in the vicinity of or within a shoreside assigned zone only low-sparking hand-tools (e.g. chromium vanadium steel screwdrivers and wrenches) shall be used.".

8.1.6.2 Amendment does not apply to the English text.

8.1.6.3 Amend to read as follows:

"8.1.6.3 The proper functioning of the special equipment referred to in 8.1.5.1, the gas detection systems referred to in 9.3.1.12.4, 9.3.2.12.4 and 9.3.3.12.4 and the oxygen measuring system referred to in 9.3.1.17.6, 9.3.2.17.6 and 9.3.3.17.6 must be checked in accordance with the instructions of the manufacturer by persons authorized for this purpose by the manufacturer. A certificate concerning the latest inspection of the special equipment must be carried on board. The certificate must provide details of the result and date of the checks.

The gas detection systems and the oxygen measuring systems must also be inspected by a recognized classification society whenever the certificate of approval is renewed and during the third year of validity of the certificate. This inspection must include at least a general visual inspection of the installations and confirmation that the checks mentioned in the preceding sentence have been carried out.

An inspection certificate from the recognized classification society concerning the latest inspection conducted must be carried on board. All inspection certificates must provide at least the abovementioned details regarding the inspection, its results and the date on which it was conducted.".

8.1.6.4 Replace "the user" by "the expert".

8.1.6.5 Delete and insert "*(Deleted)*".

8.1.7 Amend the heading to read as follows: "**Installations, equipment and self-contained protection systems**". Delete the text after the heading.

8.1.7 Add the following new paragraphs:

"**8.1.7.1** ***Electrical installations and equipment***

The insulation resistance of the fixed electrical installations and equipment and their earthing shall be inspected whenever the certificate of approval is renewed and, in addition, within

the third year from the date of issue of the certificate of approval by a person authorized for this purpose by the competent authority.

A certificate concerning this inspection shall be carried on board.

8.1.7.2 ***Installations and equipment intended for use in explosion hazardous areas, "limited explosion risk" type equipment, installations and equipment complying with 9.3.1.51, 9.3.2.51 and 9.3.3.51 and autonomous protective systems***

Such installations, equipment and autonomous protective systems and their compliance with the documents referred to in 8.1.2.2 (e) to (h) or 8.1.2.3 (r) to (v) in respect of the situation on board shall be inspected whenever the certificate of approval is renewed and, in addition, within the third year from the date of issue of the certificate of approval, by a person authorized for this purpose by the classification society that classified the vessel or by the competent authority. A certificate concerning this inspection shall be carried on board.

The marking on the installations and equipment intended for use in explosion hazardous areas showing that they are appropriate for use in explosion hazardous areas and marking on self-contained protection systems with their conditions of use should remain in place throughout the period of use on board.

The manufacturer's instruction on flame arresters or high-velocity vent valves/safety valves may require a more regular frequency of inspection.

8.1.7.3 ***Repair of explosion-protected installations and equipment and autonomous protection systems***

Repair of explosion-protected installations and equipment and autonomous protection systems is permitted only by an expert from a specialized company. Following repairs, a certificate must be issued attesting to their reusability in explosion hazardous areas. The certificate must be available on board.".

8.1.8 Amend to read as follows:

"8.1.8 Inspection of the cargo pump-rooms of tank vessels

The cargo pump-room must be inspected by a recognized classification society whenever the certificate of approval is renewed and during the third year of validity of the certificate.

The inspection must include at least the following:

- An inspection of the entire system, focusing on its state, corrosion, leaks and any unauthorized modifications;
- A general visual inspection of the state of the gas detection system in the cargo pump-room;
- Confirmation of the presence of the certificate referred to in 8.1.6.3 issued by the manufacturer or an authorized person.

The inspection certificates signed by the recognized classification society concerning the inspection of the cargo pump-room must be carried on board and provide at least the abovementioned details regarding the inspection, its results and the date on which it was conducted.".

8.1 Replace "8.1.8 – 8.1.10 (*Deleted*)" par "8.1.9 and 8.1.10 (*Deleted*)".

Chapter 8.2

8.2.1.4 Amend as follows:

In the third sentence, replace "as often as desired" by "two times".

Delete the last two sentences.

Add a new fourth sentence to read as follows: "If the test is not passed after two times then, within the period of validity of the certificate, the refresher course may be taken again.".

8.2.1.6 In the first indent, replace "refresher specialization course" by "refresher course". Delete the paragraph after the indents.

8.2.1.8 In the first indent, replace "refresher specialization course" by "refresher course". Delete the paragraph after the indents.

8.2.1.9 Amend the first sentence to read as follows: "The document attesting training and experience in accordance with the requirements of Chapter V of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers of 7 July 1978 (STCW Convention), as amended; on liquefied gas tankers shall be equivalent to the certificate referred to in 8.2.1.5, provided it has been recognized by a competent authority.".

8.2.1.10 Amend the first sentence to read as follows: "The document attesting training and experience in accordance with the requirements of Chapter V of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers of 7 July 1978 (STCW Convention), as amended; on chemical tankers shall be equivalent to the certificate referred to in 8.2.1.7, provided it has been recognized by a competent authority.".

8.2.1.11 Delete and insert *"(Deleted)"*.

8.2.2.3.1.1 Amend the indent on measurement techniques to read as follows:

"- Measurements of toxicity, oxygen content and the concentration of flammable gases.".

8.2.2.3.1.1 In the indent on practical exercises, replace "flammable gas detectors" by "gas detectors". At the end add:

"Basics of explosion protection:

- According to the definition of 'explosion protection';
- Selection of appropriate devices and installations.".

8.2.2.3.1.3 Under "Treatment of cargo tanks and adjacent spaces", amend the first indent to read as follows:

"- degassing into the atmosphere and to reception facilities, cleaning, maintenance,".

8.2.2.3.1.3 Amend the first indent on measurement techniques to read as follows:

- Measurements of toxicity, oxygen content and the concentration of flammable gases.".

8.2.2.3.1.3 At the end add:

"Basics of explosion protection:

- According to the definition of 'explosion protection';
- Selection of appropriate devices and installations.".

8.2.2.3.3.1 Under "Practice", amend the seventh indent to read as follows:

"- Certificates for the status of being gas free and permitted work".

8.2.2.3.3.2 Under "Practice", in the first indent, replace "gas freeing" by "degasing". Amend the eight indent to read as follows:

"- Certificates for the status of being gas free and permitted work".

8.2.2.8 Amend to read as follows:

"8.2.2.8 ADN specialized knowledge certificate

8.2.2.8.1 The issue and renewal of the ADN specialized knowledge certificate conforming to the model in 8.6.2 shall be the responsibility of the competent authority or a body authorized by such authority.

8.2.2.8.2 The certificate's dimensions shall be in accordance with ISO/IEC 7810:2003, card size ID-1, and it shall be made of plastic. The colour shall be white, with black lettering. The certificate shall include an additional security feature such as a hologram, UV printing or engraved patterns. Its text shall be in the language(s) or in one of the languages of the State whose competent authority has issued it. If none of these languages is English, French or German, the title of the certificate, the title of item 8 and the titles on the back, and if applicable the additions under "tank vessels" or "dry cargo vessels" shall also be drawn up in English, French or German.

8.2.2.8.3 Certificates shall be issued to:

(a) candidates who have met the conditions of the second sentence of 8.2.1.2 and 8.2.1.3 (basic training course); they shall be valid for five years from the date when the examination has been passed following basic training;

(b) Candidates who meet the conditions of 8.2.1.5 or of 8.2.1.7 ("gas" or "chemicals" specialization course); in this case, a new certificate shall be issued containing certificates for the basic training and specialization courses. The new certificate to be issued shall be valid for five years from the date when the examination has been passed following basic training.

8.2.2.8.4 The certificate shall be renewed:

(a) when the proof required under 8.2.1.4 is provided (basic training; the new duration of validity shall begin on the expiry date of the previous certificate. If the test has been taken more than one year before the certificate's expiry date, it shall begin on the date of the certificate of participation in the course;

(b) when the proof required under 8.2.1.6 and 8.2.1.8 are provided ("gas" or "chemicals" specialization courses). In this case, a new certificate containing all the certificates relating to the basic training and specialization courses shall be issued. The new certificate to be issued shall have a period of validity of five years from the date of the successfully completed refresher course for basic training. When the refresher course is taken in the year before the certificate's expiry date, the new period of validity shall begin on the expiry date of the previous certificate; otherwise it shall begin on the date of the certificate of participation in the course.

8.2.2.8.5 If the refresher course for the renewal of the certificate has not been fully and successfully completed before the expiry of the period of validity of the certificate, or if the work on board a vessel for one year has not been certified during the two years preceding the certificate's expiry, a new certificate shall be issued, for which participation in a further initial basic training course and an examination in accordance with 8.2.2.7 shall be required.

8.2.2.8.6 If a new certificate is issued in accordance with 8.2.2.8.3 (b) or a certificate is renewed in accordance with 8.2.2.8.4 and the previous certificate had been issued by another authority or by a body authorized to do so by such an authority, the issuing authority or body

approved by that authority that has issued the previous certificate shall be informed without delay.

8.2.2.8.7 Contracting Parties shall provide the UNECE secretariat with a model for any certificate intended for issue in accordance with this section, along with models of certificates which are still valid. Contracting Parties may additionally provide explanatory notes. The UNECE secretariat shall make the information received available to all Contracting Parties.

Chapter 8.3

8.3.2 Amend to read as follows:

"**8.3.2 Portable lighting apparatus**

On board, only portable lighting appliances with their own source of power are permitted in explosion hazardous areas and on deck.

In explosion hazardous areas, they shall meet at least the requirements for use in the relevant area.".

8.3.4 Amend to read as follows:

"**8.3.4 Prohibition on smoking, fire and naked light**

Smoking, including of electronic cigarettes and similar devices, fire and naked light are prohibited on board. However, the provisions of 7.1.3.41.1 and 7.2.3.41.1 are applicable.

This prohibition shall be displayed on notice boards at appropriate places.

The prohibition does not apply in the accommodation or the wheelhouse, provided that their windows, doors, skylights and hatches are closed or the ventilation system is adjusted to guarantee an overpressure of at least 0.1 kPa.".

8.3.5 Amend to read as follows:

"**8.3.5 Work on board**

No work requiring the use of an open flame or electric current or liable to cause sparks may be carried out on board.

This provision does not apply:

- To berthing operations;
- In the service spaces outside the protected area or the cargo area, provided the doors and openings of those areas are closed for the duration of the work and the vessel is not being loaded, unloaded or gas-freed; or
- When the vessel is not in the vicinity of or within an onshore assigned zone and, in the case of a tank vessel, has a certificate attesting to the totally gas-free condition of the vessel in accordance with 7.2.3.7.6 or an authorization from the competent authority or in the case of a dry cargo vessel, has a certificate attesting to the totally gas-free condition of the protected area or an authorization from the competent authority.

The use of low-sparking hand-tools (chromium vanadium steel screwdrivers and wrenches or screwdrivers and wrenches of equivalent material from the point of view of spark formation) and appropriate equipment at least for the zone concerned is permitted.

NOTE: *In addition, all other applicable regulations regarding workplace safety and safety of operations must be observed.".*

Chapter 8.6

8.6.1.1 and 8.6.1.2 Amend point 4 of the model to read as follows:

"4. Additional requirements: Vessel referred to in 7.1.2.19.1[1]

Vessel referred to in 7.2.2.19.3[1]

The vessel complies with the additional rules of construction referred to in 9.1.0.80 to 9.1.0.95/9.2.0.80 to 9.2.0.95[1]

Vessel complies with the rules of construction referred to in 9.1.0.12.3 (b) or (c), 9.1.0.51 or 9.1.0.52[1]

Ventilation system referred to in 9.1.0.12.3 (b)[1]

in .....

Vessel complies with the rules of construction referred to in 9.1.0.53[1]

Electrical and non-electrical installations and equipment for use in protected areas:

Temperature classification: .....

Explosion group: .....".

8.6.1.3 and 8.6.1.4 Amend point 7 of the model to read as follows:

"7. Opening pressure of the pressure relief valves/high-velocity vent valves/safety valves ..... kPa[1,2]".

8.6.1.3 and 8.6.1.4 Amend the end of point 8 of the model to read as follows:

"...

Pump-room below deck Yes/No[1]

Ventilation system according to 9.3.x.12.4 (b) Yes/No[1,3]

in .....

Conforms to the rules of construction referred to in 9.3.x.12.4 (b) or 9.3.x.12.4 (c), 9.3.x.51 and 9.3.x.52 Yes/No[1,3]

- Venting piping and heated installation Yes/No[1,2]
- Conforms to the rules of construction resulting from the remark(s) ... in column (20) of Table C of Chapter 3.2[1,2]

[3] For "x", note the relevant information".

8.6.1.3 and 8.6.1.4 Amend point 9 of the model to read as follows:

"9. Electrical and non-electrical installations and equipment for use in explosion hazardous areas:

- Temperature class .....
- Explosion group .....".

8.6.1.3 and 8.6.1.4 Add the following new point 10:

"10. Autonomous protection systems:

Explosion group/subgroup of explosion group II B: .....".

Renumber the rest of the points accordingly.

8.6.1.3 and 8.6.1.4 Amend new point 13 (former point 12) to read as follows:

"13. Additional observations:

Vessel complies with the rules of construction referred to in 9.3.x.12, 9.3.x.51, 9.3.x.52
Yes/No[1, 3]

.....

.....

.....

[3] For "x", note the relevant information.".

8.6.1.3 and 8.6.1.4, page 3 of the models

- Line 8: Replace "high velocity vent valve" by "pressure relief device/high velocity vent valve".
- Delete line 17 ("venting piping according to 9.3.2.22.5 or 9.3.3.22.5").

8.6.2 Amend to read as follows:

"8.6.2 Certificate of special knowledge of ADN according to 8.2.1.2, 8.2.1.5 or 8.2.1.7

(Recto)

(**)

Certificate of special knowledge of ADN

1. (No. of certificate)
2. (Name)
3. (First name(s))
4. (Born on DD/MM/YYYY)
5. (Nationality)
6. (Signature of holder)
7. (Issued by)
8. VALID UNTIL (DD/MM/YYYY)

Photo of holder

(Verso)

1. (No. of certificate)

The certificate is valid for special knowledge of ADN according to:
(Insert the corresponding subsection of ADN 8.2.1, if applicable with the mention "only for dry cargo vessels" or "only for tank vessels".)

** Letter code(s) used for international navigation (CEVNI – Annex 1).".

8.6.3, ADN Checklist, question 12.2 Replace "at the connecting point" by "at the connecting-point of the vapour return piping and the venting piping". Replace "of the high velocity vent valves" by "of the pressure relief devices/high velocity vent valves".

8.6.3, question 18 Amend to read as follows:

"To be filled in only in the case of loading or unloading of substances for the carriage of which a closed cargo tank or an open cargo tank with flame arrester is required:

Are the cargo tank hatches and cargo tank inspection and sampling openings closed or protected by flame arresters fulfilling the requirements of column (16) of Table C of Chapter 3.2?".

8.6.3, ADN Checklist, Explanations of question 4 Amend the first sentence to read as follows: "It must be possible to escape safely from the vessel at any time.". In the last sentence, delete "7.1.4.77 and".

8.6.4 Amend to read as follows:

"**8.6.4 Checklist degassing to reception facilities**

1

ADN Checklist

concerning the observance of safety provisions and the implementation of the necessary measures for degassing to reception facilities

– **Particulars of vessel**

..... No. .....
(name of vessel) (official number)

.....
(vessel type)

– **Particulars of reception facility**

....
(reception facility) (place)

....
(date) (time)

Reception facility approved according CDNI ☐ Yes ☐ No

– **Particulars of the previous cargo in the tank before degassing as indicated in the transport document**

Cargo tank #	Quantity m³	Proper shipping name**	UN Number or Identification number	Dangers*	Packing Group
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....		.....	.....	.....	

** Dangers indicated in column (5) of Table C, as relevant (as mentioned in the transport document in accordance with 5.4.1.1.2 (c)).*

*** The proper shipping name given in column (2) of Table C of Chapter 3.2, supplemented, when applicable, by the technical name in parenthesis.*

		2
Degassing rate		
Proper shipping name**	Cargo tank number	agreed rate of degassing rate m^3/h
.....	.....	.....
.....	.....	.....
.....	.....	.....

Questions to the master or the person mandated by him and the person in charge at the reception facility

Degassing may only be started after all questions on the checklist have been checked off by "X", i.e. answered with YES and the list has been signed by both persons.

Non-applicable questions have to be deleted.

If not all questions can be answered with YES, degassing is only allowed with consent of the competent authority.

** *The proper shipping name given in column (2) of Table C of Chapter 3.2, supplemented, when applicable, by the technical name in parenthesis.*

		vessel	3 reception facility
1.	Is the vessel well moored in view of local circumstances?	O	–
2.	Are the pipings for degassing between vessel and reception facility in satisfactory condition?	–	O
	Are they correctly connected and are appropriate flame arresters fitted in the piping between the vessel and the reception facility?	O	O
3.	Are all flanges of the connections of the piping for loading and unloading and of the venting piping not in use, correctly blanked off?	O	O
4.	Is continuous and suitable supervision of degassing ensured for the whole period of the operation?	O	O
5.	Is communication between vessel and reception facility ensured?	O	O
6.1	Is it ensured that the reception facility is such that the pressure at the connecting point cannot exceed the opening pressure of the high-velocity vent valves (pressure at connecting point __ kPa)?	–	O*
6.2	Is the air inlet part of a closed system or equipped with a spring-loaded low-pressure valve?	–	O**
6.3	When anti-explosion protection is required in Chapter 3.2, Table C, column (17) does the reception facility ensure that its piping is such that the vessel is protected against detonations and passage of flames from the reception facility.	–	O
7.	Is it known what actions are to be taken in the event of an "Emergency-stop" and an "Alarm"?	O	O

* *Not applicable if vacuum is used to generate air flows.*

** *Only applicable is vacuum is used to generate air flows.*

		vessel	4 reception facility
8.	Check on the most important operational requirements:		
	– Are the required fire extinguishing systems and appliances operational?	O	O
	– Have all valves and other closing devices been checked for correct open or closed position?	O	O
	– Has smoking been generally prohibited?	O	O
	– Are the flame operated heating applications on board turned off?	O	–
	– Is the voltage cut off from the radar installations?	O	–
	– Is all electrical equipment marked red switched off?	O	–
	– Are all windows and doors closed?	O	–
9.1	Has the pressure of the vessel's piping been adjusted to the permissible working pressure of the reception facility? (agreed pressure __ kPa)	O	–
9.2	Has the pressure of the reception facility piping been adjusted to the permissible working pressure of the on–board installation? (agreed pressure __ kPa)	–	O
10.	Are the cargo tank hatches and cargo tank inspection, gauging and sampling openings closed or protected by flame arresters in good condition?	O	–

Checked, filled in and signed	
for the vessel:	for the reception facility:
.....	.....
(name in capital letters)	(name in capital letters)
.....	.....
(signature)	(signature)

Explanation

Question 1

"Well moored" means that the vessel is fastened to the pier or the reception facility in such a way that, without intervention of a third person, movements of the vessel in any direction that could hamper the degassing operation will be prevented. Established or predictable variations of the water–level at that location and special factors have to be taken into account.

Question 2

The material of the piping must be able to withstand the expected rates and be suitable for degassing. The piping between vessel and reception facility must be placed so that it cannot be damaged by ordinary movements of the vessel during the degassing process or by variations of the water.

Question 4

Degassing must be supervised on board and at the reception facility so that dangers which may occur in the vicinity of the piping between vessel and reception facility can be recognized immediately. When supervision is effected by additional technical means it must be agreed between the reception facility and the vessel how it is to be ensured.

Question 5

For a safe degassing operation good communications between vessel and shore are required. For this purpose telephone and radio equipment may be used only if of an explosion protected type and located within reach of the supervisor.

Question 7

Before the start of the degassing operation the representative of the reception facility and the master or the person mandated by him must agree on the applicable procedure. The specific properties of the substances to be degassed have to be taken into account.".

Chapter 9.1

9.1.0.12.1 Delete the second sentence: "The ventilator fan shall be designed so that no sparks may be emitted on contact of the impeller blades with the housing and no static electricity may be generated.".

9.1.0.12.3 Amend to read as follows:

"(a) Ventilation shall be provided for the accommodation, wheelhouse and for service spaces;

(b) The ventilation system in such spaces shall meet the following requirements:

(i) The air intakes of the ventilation system shall be located as far away as possible, and not less than 6.00 m from the protected area and not less than 2.00 m above the deck;

(ii) Overpressure of at least 0.1 kPa (0.001 bar) may be maintained in the premises;

(iii) A breakdown alarm is integrated;

(iv) The ventilation system, including the breakdown alarm, shall be at least of the 'limited explosion risk' type;

(v) A gas detection system conforming to conditions 1. to 4. below is connected to the ventilation system:

1. It is appropriate at least for use in zone 1, explosion group IIC and temperature class T6;

2. It is equipped with sensors:

- On the suction inlets of the ventilation systems; and
- Directly below the top edge of the sill of the entrance doors;

3. Its t90-time is lower than or equal to 4 s;

4. Measurement shall be continuous;

(vi) In the service spaces, the ventilation system is linked to the emergency lighting, which shall be at least of the 'limited explosion risk' type;

This emergency lighting is not necessary if the lighting installations in the service spaces are of at least the 'limited explosion risk' type;

(vii) The suction of the ventilation system and installations and equipment that do not meet the requirements of 9.1.0.51 and 9.1.0.52.1 shall be shut down when a concentration equal to 20 % of the LEL of n-Hexane is reached;

The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;

(viii) In the event of failure of the ventilation system or of the gas detection installations in the accommodation, installations and equipment in the accommodation that do not comply with the requirements of 9.1.0.51 and 9.1.0.52.1 shall be switched off;

The switching-off shall be indicated in the accommodation, the wheelhouse and on the deck by visual and audible signals;

(ix) In the event of failure of the ventilation system or of the gas detection installations in the wheelhouse or the service spaces, installations and equipment in those spaces that do not comply with the requirements of 9.1.0.51 and 9.1.0.52.1 shall be switched off;

The switching-off shall be indicated in the wheelhouse and on the deck by visual and audible signals. The alarm must be relayed to the accommodation automatically if it has not been switched off;

(x) Any switching-off shall take place immediately and automatically and, if necessary, shall switch on the emergency lighting;

The automatic switch-off device is set so that no automatic switching-off may occur while the vessel is under way;

(c) If there is no ventilation system or the ventilation system of a space does not comply with all the requirements set out in (b) above, any installations or equipment present in that space that may, if switched on, give rise to surface temperatures higher than those mentioned in 9.1.0.51 or that do not meet the requirements set out in 9.1.0.52.1 must be capable of being switched off.".

9.1.0.12 Insert the following new paragraphs:

"9.1.0.12.4 Notice boards shall be fitted at the ventilation inlets indicating the conditions under which they shall be closed. All ventilation inlets of accommodation, wheelhouse and service spaces leading into the open air outside of the protected area shall be located not less than 2.00 m from the protected area.

All ventilation inlets shall be fitted with fixed devices according to 9.1.0.40.2.2 (c) enabling them to be closed rapidly. It shall be clear whether they are open or closed.

9.1.0.12.5 Ventilators including their motors used within the protected area and motors for hold ventilators which are arranged in the air flow shall fulfil at least the requirements for use in zone 1. They shall meet at least the requirements for temperature class T4 and explosion group II B.

9.1.0.12.6 The requirements of 9.1.0.12.3 (b) or (c) must be met only if the vessel is located within or in the immediate vicinity of a shoreside assigned zone.".

9.1.0.31.1 Add a new last sentence to read as follows:

"This provision does not apply to internal combustion engines which are part of propulsion and auxiliary systems. These systems shall meet the requirements of Chapter 30 and Annex 8, Section 1 of the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) as amended*.".

9.1.0.32.2 Amend to read as follows:

"9.1.0.32.2 The open ends of the air pipes of each oil fuel tanks shall be extended to not less than 0.50 m above the open deck. These open ends and the open ends of overflow pipes

* *As available on the website of the Comité Européen pour l'Élaboration de Standards dans le Domaine de Navigation Intérieure – CESNI, https://www.cesni.eu/en/documents/es-trin*

leading to the deck shall be fitted with a protective device consisting of a gauze diaphragm or a perforated plate.".

9.1.0.40.2.1 Add new subparagraphs (e) and (f) to read as follows:

"(e) (Reserved);

(f) K_2CO_3 (potassium carbonate).".

9.1.0.40.2.2 (f) Amend to read as follows:

"(f) Protected spaces shall have a facility for extracting the extinguishing agent and the combustion gases. Such facilities shall be capable of being operated from positions outside the protected rooms and which must not be made inaccessible by a fire within such spaces. If there are permanently installed extractors, it shall not be possible for these to be switched on while the fire is being extinguished.".

9.1.0.40.2.7 Amendment does not apply to the English text.

9.1.0.40.2.14 Renumber as 9.1.0.40.2.16. Insert "9.1.0.40.2.14 *(Reserved)*".

9.1.0.40.2.15 Add a new subsection to read as follows:

"9.1.0.40.2.15 Fire-fighting systems using K_2CO_3 as the extinguishing agent

In addition to the requirements laid down in 9.1.0.40.2.1 to 9.1.0.40.2.3, 9.1.0.40.2.5, 9.1.0.40.2.6, and 9.1.0.40.2.9, fire-fighting systems using K_2CO_3 as the extinguishing agent shall comply with the following provisions:

(a) The fire-fighting system shall have a type-approval pursuant to Directive 2014/90/EU[1] or to MSC/Circ. 1270[2];

(b) Each room shall be provided with its own firefighting system;

(c) The extinguishing agent must be stored in specially provided unpressurised tanks in the room to be protected. These tanks shall be fitted in such a way that the extinguishing agent is dispensed evenly in the room. In particular the extinguishing agent shall also work underneath the deck plates;

(d) Each tank is separately connected with the triggering device;

(e) The quantity of dry aerosol-forming extinguishing agent relative to the room to be protected shall be at least 120 g per m^3 of the net volume of this room. This net volume is calculated according to Directive 2014/90/EU[1] or to MSC/Circ. 1270[2]. It shall be possible to supply the extinguishing agent within 120 seconds.".

Replace "9.1.0.42-9.1.0.51 (Reserved)" by "9.1.0.42-9.1.0.50 *(Reserved)*".

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[1] *Official Journal of the European Union, L 257 of 28 August 2014, p.146.*

[2] *International Maritime Organization Circular MSC/Circ. 1270 and corrigenda — Revised Guidelines for the approval of fixed aerosol fire-extinguishing systems equivalent to fixed gas extinguishing systems, as referred to in SOLAS 1974, for machinery spaces — adopted on 29 August 2008.*

[1] *Official Journal of the European Union, L 257 of 28 August 2014, p.146.*

[2] *International Maritime Organization Circular MSC/Circ. 1270 and corrigenda — Revised Guidelines for the approval of fixed aerosol fire-extinguishing systems equivalent to fixed gas extinguishing systems, as referred to in SOLAS 1974, for machinery spaces — adopted on 29 August 2008.*

9.1.0.51 Add the following new paragraph:

"**9.1.0.51 Surface temperatures of electrical and non-electrical installations and equipment**

(a) The surface temperatures of electrical and non-electrical installations and equipment as well as the outer parts of engines and their inlets and exhaust ducts shall not exceed 200 °C;

(b) The following are exempt from the above provision:

- Accommodation, wheelhouse and service spaces where surface temperatures higher than 200 °C occur that are equipped with a ventilation system according to 9.1.0.12.3; or
- Installations and equipment which generate surface temperatures higher than 200 °C and that can be switched off. Such installations and equipment shall be marked in red;

(c) Within the protected area, 9.1.0.53.1 applies;

(d) The requirements of 9.1.0.51 (a) and (b) must be met only if the vessel is located within or in the immediate vicinity of a shoreside assigned zone.".

9.1.0.52 Amend the heading to read as follows: "***Type and location of electrical installations and equipment***".

9.1.0.52.1 Amend to read as follows:

"Electrical installations and equipment outside the protected area shall be at least of the 'limited explosion risk' type. This provision does not apply to:

(a) Lighting installations in the accommodation and in the wheelhouse, except for switches located near to the entrances;

(b) Mobile phones, fixed telephone installations as well as stationary and portable computers in the accommodation or the wheelhouse;

(c) Electrical installations and equipment which, during a stay in the immediate vicinity of or within a shoreside assigned zone, are:

- Not live; or
- Installed in spaces which are equipped with a ventilation system according to 9.1.0.12.3;

(d) Radiotelephone installations and inland AIS (automatic identification systems) stations in the accommodation and in the wheelhouse if no part of an aerial for radiotelephone installations or AIS stations is situated above or within 2.00 m from the protected area.".

9.1.0.52.2 Amend to read as follows:

"9.1.0.52.2 Fixed electrical installations and equipment which do not meet the requirements set out in 9.1.0.52.1 and their switches shall be marked in red. The disconnection of such equipment shall be controlled from a centralized location on board.".

9.1.0.52.3 Add at the end:

"The sockets shall be designed to ensure that it is only possible to connect or disconnect them when they are not live.".

9.1.0.52 Insert the following new paragraphs:

"9.1.0.52.5 Failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals in the wheelhouse and on the deck. The alarm must be relayed to the accommodation automatically if it has not been switched off.

9.1.0.52.6 Electrical switches, sockets and cables on deck shall be protected against mechanical damage.

9.1.0.52.7 The requirements of 9.1.0.52.1 and 9.1.0.52.2 shall be met only if the vessel is located within or in the immediate vicinity of an onshore assigned zone.".

9.1.0.53 Insert the following new paragraphs:

"**9.1.0.53** ***Type and location of electrical and non-electrical installations and equipment intended for use in the protected area***

9.1.0.53.1 It shall be possible to switch off the electrical installations and equipment in the protected area by means of centrally located isolation switches except where:

- In the holds, they are appropriate at least for use in zone 1, for temperature class T4 and explosion group II B; and
- In the protected area on the deck, they are of the limited explosion risk type.".

The corresponding electrical circuits shall have control lamps to indicate whether or not the circuits are live.

The isolation switches shall be protected against unintended operation. Submerged pumps installed or used in the holds shall be appropriate at least for use in zone 1, temperature class T4 and explosion group II B.

9.1.0.53.2 The sockets used in the protected area shall be designed so as to prevent connection or disconnection except when they are not live.

9.1.0.53.3 Except in the case of optical fibres, electrical cables within the protected area shall be armoured or placed in a metallic sheath or in protective tubes.

9.1.0.53.4 Movable electric cables are prohibited in the protected area, except electric cables for intrinsically safe electric circuits or for connecting:

- Signal lights and lighting for gangways, provided the connection point (for example, the socket) is permanently fitted to the vessel close to the signal mast or gangway;
- Containers;
- Electrically operated hatch cover gantries;
- Submerged pumps;
- Hold ventilators;
- The power network on a vessel to a land-based power network; provided that:
  - (a) The electric cables and the power supply unit conform to a valid standard (for example, EN 15869-03: 2010);
  - (b) The power supply unit and connectors are located outside of the protected area.

Connecting and disconnecting sockets/connectors shall only be possible when they are not live.

9.1.0.53.5 For movable electrical cables permitted in accordance with 9.1.0.53.4, only rubber-sheathed electrical cables of type H07 RN-F in accordance with IEC-60245-4:2011* or electrical cables of at least equivalent design having conductors with a cross-section of not less than 1.5 mm^2, shall be used.

9.1.0.53.6 Non-electrical installations and equipment in the protected area which are intended for use during loading and unloading or stay in the immediate vicinity of or within a shoreside assigned zone shall meet at least the requirements for use in the area concerned. They shall meet at least the requirements for temperature class T4 and explosion group II B.".

Replace "9.1.0.53-9.1.0.55 (Reserved)" by "9.1.0.54-9.1.0.55 *(Reserved)*".

9.1.0.56 Delete and insert "*(Deleted)*".

9.1.0.56.1, 9.1.0.56.2, 9.1.0.56.3 Delete

Chapter 9.3

9.3.x.0.2 Replace "or plastic materials" by ", plastic materials or rubber".

9.3.x.0.3 Amend to read as follows:

"9.3.x.0.3 The use of wood, aluminium alloys, plastic materials or rubber in the cargo area is permitted as shown in the following table:

The use of wood, aluminium alloys, plastic materials or rubber is permitted only for:				**(X indicates permitted)**
	Wood	**Aluminium alloys**	**Plastic material**	**Rubber**
Gangways	X	X	X	X
External ladders and passageways (gangways) *)		X	X	X
Cleaning equipment, e.g. brooms	X		X	X
Movable equipment e.g. fire extinguishers, portable gas detectors, rescue winches		X	X	X
Fenders	X		X	X
Mooring cables, fender ropes			X	
Chocking of cargo tanks which are independent of the vessel's hull and chocking of installations and equipment	X		X	
Masts and similar round timber	X	X	X	
Engine parts		X	X	
Protective covers of engines and pumps			X	
Parts of the electrical installation		X	X	
Parts of the loading and unloading installation, e.g., gaskets		X	X	X
Boxes, cabinets or other receptacles placed on the deck for storage of disposal and recovery equipment for capstans, extinguishers, fire hoses, waste, etc.		X	X	
Supports and stops of any kind	X		X	
Ventilators, including hose assemblies for ventilation		X	X	
Parts of the water spray system, the shower and the eye and face bath		X	X	

* *Identical to EN 50525-2-21: 2011*

The use of wood, aluminium alloys, plastic materials or rubber is permitted only for:				**(X indicates permitted)**
	Wood	**Aluminium alloys**	**Plastic material**	**Rubber**
Insulation of cargo tanks and of piping for loading and unloading, gas discharge pipes and heating pipes			X	X
Coating of cargo tanks and of piping for loading and unloading		X	X	X
All kinds of gaskets (e.g. for dome or hatch covers)			X	X
Cables for electrical equipment			X	X
Mat under hose assemblies for loading and unloading piping system			X	X
Fire hoses, air hoses, hoses for cleaning the deck, etc.			X	X
Sampling equipment and bottles			X	
Photo-optical copies of the certificate of approval according to 8.1.2.6 or 8.1.2.7, and of the vessel's certificate, the measurement certificate and the Rhine navigation membership certificate		X	X	
Drip trays			X	
(*) Take account of 9.3.1.0.5, 9.3.2.0.5 or 9.3.3.0.5, as appropriate				
Aluminium gauging rods are permitted, provided that they are fitted with brass feet or protected in another way to avoid sparking.				

All permanently fitted materials in the accommodation or wheelhouse, with the exception of furniture, shall not readily ignite. They shall not evolve fumes or toxic gases in dangerous quantities, if involved in a fire.".

9.3.x.0.5 Amend to read as follows:

"The use of plastic material for a vessel's boats is permitted only if the material does not readily ignite.. Except where explicitly permitted in 9.3.x.0.3 or in the certificate of approval, the use of wood, aluminium alloys, plastic materials or rubber is prohibited.

The use of aluminium alloys or plastic material for passageways (gangways) in the cargo area is permitted only if the material does not readily ignite or conduct electricity.".

9.3.x.8.2 Delete and insert *"(Deleted).".*

9.3.x.8.3 Delete and insert *"(Deleted).".*

9.3.1.8.4 and 9.3.2.8.4 Add the following new paragraph: "The conformity of the documents required in 8.1.2.3 (r) to (v) with the circumstances on board shall be inspected by a recognized classification society, an inspection body or by a person authorized for that purpose by the competent authority whenever the certificate of approval is renewed and, in addition, once during the third year of validity of the certificate of approval. A signed certificate must be available on board.".

9.3.x.10 Amend the heading to read as follows: "***Protection against the penetration of dangerous gases and the spreading of dangerous liquids***".

9.3.x.10.1 Amend to read as follows:

"The vessel shall be designed so as to prevent dangerous gases and liquids from penetrating into the accommodation, wheelhouse and service spaces. None of the windows in these

spaces shall be capable of being opened unless its intended use is as an emergency exit and it is marked as such.".

9.3.x.10.2 Amend to read as follows:

"Liquid-tight protective coamings shall be fitted on deck at the height of the external bulkheads of the cargo tanks, at a maximum distance of 0.60 m from the outer cofferdam bulkheads or the hold end bulkheads. The protective coamings shall either extend over the entire width of the vessel or be fixed between the longitudinal spill coamings so as to prevent liquids from entering the forepeak and afterpeak. The height of the protective coamings and the spill coamings shall be at least 0.075 m. The protective coaming may correspond to the protection wall prescribed in 9.3.x.10.3 if the protection wall extends across the entire width of the vessel.".

9.3.1.10.3 Amend to read as follows:

"9.3.1.10.3 If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the use of installations and equipment that are not of at least the 'limited explosion risk' type is not permitted during loading and unloading operations in parts of the deck outside the cargo area, unless those parts are protected against the entry of gases and liquids by a gas- and liquid-tight protection wall. The wall must either extend from one side of the vessel to the other or surround the areas to protect in an U-shaped form. The wall must cover the whole width of the area to protect and at least 1.00 m in the direction opposite to the cargo area (see Classification of zones diagram). The height of the wall shall be at least 1.00 m above the adjacent cargo deck area in the cargo area. The outer wall and side walls of the accommodation can be considered as a protection wall if they do not include openings and if the dimensions are complied with.

A protection wall is not required where the distance between the areas to be protected and the safety valve, the shore connections of the piping for loading and unloading, and venting piping, the compressor on deck and the opening of the closest pressure tanks is at least 12.00 m.".

9.3.x.10.4 Amend to read as follows:

"On deck, the lower edges of door-openings in the sidewalls of superstructures and the sills of hatches and ventilation openings of premises located under the deck shall have a height of not less than 0.50 m above the deck.

This requirement does not apply to access openings to double-hull spaces and double bottoms.".

9.3.1.10.5 and 9.3.2.10.5 Add the following new paragraph:

"The bulwarks, foot-rails, etc., shall be provided with sufficiently large openings which are located directly above the deck.".

9.3.1.11.3 (a) Amend the first sentence to read as follows: "The hold spaces shall be separated from the accommodation, engine rooms and service spaces outside the cargo area below deck by bulkheads of Class "A-60" as defined in SOLAS 74, Chapter II-2, Regulation 3.".

9.3.2.11.3 (c) and 9.3.3.11.3 (c) Amend the second sentence to read as follows: "It has to be possible to check their gas-free condition.".

9.3.1.12.3 and 9.3.2.12.3 Amend to read as follows:

"(a) A service space located within the cargo area below deck shall be provided with a ventilation system. The capacity of the fans shall be sufficient to ensure 20 complete changes of air per hour based on the volume of the service space.

The ventilation exhaust ducts shall extend down to 50 mm above the bottom of the service space. The air shall be supplied through a duct at the top of the service space.

(b) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the air inlets shall be located not less than 2.00 m above the deck, at a distance of not less than 2.00 m from tank openings and 6.00 m from the outlets of safety valves.

The extension pipes which may be necessary may be of the hinged type.".

9.3.x.12.4 Amend to read as follows:

"(a) Ventilation shall be provided for the accommodation, wheelhouse and service spaces.

(b) The ventilation system in such spaces shall meet the following requirements:

(i) The air intakes shall be located as far away as possible, and not less than 6.00 m from the protected area and not less than 2.00 m above the deck;

(ii) Pressure of at least 0.1 kPa (0.001 bar) may be maintained in the premises;

(iii) A breakdown alarm is integrated;

(iv) The ventilation system, including the breakdown alarm, shall be at least of the 'limited explosion risk' type;

(v) A gas detection system conforming to conditions 1. to 4. below is connected to the ventilation system:

1. It is appropriate at least for use in zone 1, explosion group IIC and temperature class T6;

2. It is equipped with sensors;

- On the suction inlets of the ventilation systems; and
- Directly below the top edge of the sill of the entrance doors;

3. Its t90 response time is lower than or equal to 4 s;

4. Measurement shall be continuous;

(vi) In the service spaces, the ventilation system is linked to the emergency lighting, which shall be at least of the 'limited explosion risk' type;

This emergency lighting is not necessary if the lighting installations in the service spaces are of at least the 'limited explosion risk' type;

(vii) The suction of the ventilation system and installations and equipment that do not meet the requirements set out in 9.3.x.51 (a) and (b) and 9.3.x.52.1 must be shut down when a concentration of 20 % of LEL of n-Hexane is reached;

The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;

(viii) In the event of failure of the ventilation system or the gas detection installations in the accommodation, installations and equipment in the accommodation that

do not meet the requirements set out in 9.3.x.51 (a) and (b) and 9.3.x.52.1 must be stopped;

The failure shall be indicated in the accommodation, the wheelhouse and on the deck by visual and audible signals;

(ix) In the event of failure of the ventilation system or the gas detection installations in the wheelhouse or service spaces, installations and equipment in those spaces that do not meet the requirements set out in 9.3.x.51 (a) and (b) and 9.3.x.52.1 must be shut down;

The failure shall be indicated in the wheelhouse and on the deck by visual and audible signals. The alarm must be relayed to the accommodation automatically if it has not been switched off;

(x) Any switching-off shall take place immediately and automatically and, if necessary, shall activate the emergency lighting;

The automatic switch-off device is set so that no automatic switching-off may occur while the vessel is under way;

(c) If there is no ventilation system or the ventilation system of a space does not comply with all the requirements set out in (b) above, any installations or equipment present in that space that may, if switched on, give rise to surface temperatures higher than those mentioned in 9.3.x.51 (a) and (b) or that do not meet the requirements set out in 9.3.x.52.1 must be capable of being switched off.".

9.3.1.12.5, 9.3.2.12.5 and 9.3.3.12.5 Delete and insert "*(Deleted)*".

9.3.x.12.6 Amend to read as follows:

"Notice boards shall be fitted at the ventilation inlets indicating the conditions under which they shall be closed. All ventilation inlets of accommodation, wheelhouse and service spaces leading to the open air outside the cargo area shall be fitted with devices permanently fixed according to 9.3.x.40.2.2 (c), enabling them to be closed rapidly. It shall be clear whether they are open or closed.

Such ventilation inlets shall be located not less than 2.00 m from the cargo area.

Ventilation inlets of service spaces in the cargo area may be located within that area.".

9.3.1.17.1, 9.3.2.17.1 and 9.3.3.17.1 Amend the first sentence to read as follows:

"Accommodation spaces and the wheelhouse shall be located outside the cargo area forward of the fore vertical plane or abaft the aft vertical plane bounding the part of the cargo area below deck.".

9.3.1.17.6 Amend to read as follows:

"A service space located within the cargo area below deck shall not be used as a cargo pump room for the vessel's own gas discharging system, e.g. compressors or the compressor/heat exchanger/pump combination, except where:

- The cargo pump-room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with an insulation of Class "A-60" as defined in SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
- The 'A-60' bulkhead required above does not include penetrations referred to in 9.3.1.17.5 (a);

- Ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation, wheelhouse and service spaces outside the cargo area;
- The access hatches and ventilation inlets can be closed from the outside;
- All piping for loading and unloading (at the suction side and the delivery side) are led through the deck above the pump-room. The necessary operation of the control devices in the pump-room, starting of pumps or compressors and control of the liquid flow rate shall be effected from the deck;
- The system is fully integrated in the gas and liquid piping system;
- The cargo pump room is provided with a permanent oxygen detection system which automatically indicates the amount of oxygen and which actuates a visual and audible alarm when the oxygen concentration has reached 19.5 % by volume. The sensors of this system shall be placed at suitable positions at the bottom and at a height of 2.00 m. Measurement shall be continuous and displayed near to the entrance. Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down;
- Failure of the oxygen measuring system shall actuate a visual and audible alarm in the wheelhouse and on deck. The alarm must be relayed to the accommodation automatically if it has not been switched off;
- The ventilation system prescribed in 9.3.1.12.3 has a capacity sufficient to ensure not less than 30 changes of air per hour based on the total volume of the service space.

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the cargo pump room shall also be provided with a permanent gas detection system which automatically indicates the presence of flammable gases and actuates a visual and audible alarm when the gas concentration has reached 20 % of the LEL of the cargo or 20 % of the LEL of n-Hexane, whichever gives the more critical value.

The sensors of this gas detection system shall be placed at suitable positions at the bottom and directly below the deck.

Measurement shall be continuous and displayed near to the entrance.

Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down.

Any failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by a visual and audible warning. The alarm must be relayed to the accommodation automatically if it has not been switched off.".

9.3.1.21.9 Replace "quick action stop valve" by "quick closing valve".

9.3.1.24.1 (c) Amend to read as follows:

"(c) For UN No. 1972 only, a system for the regulation of cargo tank pressure whereby the boil-off vapours are utilized as fuel;".

9.3.1.25.2 (d) In the second paragraph, amend the fourth sentence to read as follows:

"The shut-off devices of the loading and unloading piping shall be duplicated, one of the devices being constituted by a quick closing valve.".

9.3.1.25.2 (f) Replace "quick action stop valve" by "quick closing valve".

9.3.1.25.3, 9.3.2.25.3 and 9.3.3.25.3 Delete and insert "*(Deleted)*".

9.3.x.25.10 In the first paragraph, delete "or wheelhouse" and insert ", wheelhouse" after "air system into accommodation".

9.3.1.31.1, 9.3.2.31.1 and 9.3.3.31.1 Amend to read as follows:

"Only internal combustion engines running on fuel with having a flashpoint above 55 °C are allowed. This provision does not apply to internal combustion engines which are part of propulsion and auxiliary systems. These systems shall meet the requirements of Chapter 30 and Annex 8, Section 1 of the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) as amended*.".

9.3.1.31.3, 9.3.2.31.3 and 9.3.3.31.3 Delete and insert "*(Deleted)*".

9.3.1.31.4, 9.3.2.31.4 and 9.3.3.31.4 Delete and insert "*(Deleted)*".

9.3.x.32.2 Amend to read as follows:

"The open ends of the air pipes of each oil fuel tanks shall extend to not less than 0.5 m above the open deck. These open ends and the open ends of overflow pipes leading to the deck shall be fitted with a protective device consisting of a gauze diaphragm or a perforated plate.".

9.3.1.35.1, 9.3.2.35.1 and 9.3.3.35.1 Amend the end of the second indent to read as follows: "…and bilge-pumping is performed using eductors which are installed in the cargo area.".

9.3.1.40.1, 9.3.2.40.1 and 9.3.3.40.1 In the second indent, last paragraph, delete "or wheelhouse" at the end and insert ", wheelhouse" after "into the accommodation".

9.3.x.40.2.1 Add a new subparagraph (e) and (f) to read as follows:

"(e) (Reserved);

(f) K_2CO_3 (potassium carbonate)".

9.3.x.40.2.2 (f) Amend to read as follows:

"(f) Protected spaces shall have a facility for extracting the extinguishing agent and the combustion gases. Such facilities shall be capable of being operated from positions outside the protected rooms and which must not be made inaccessible by a fire within such spaces. If there are permanently installed extractors, it shall not be possible for these to be switched on while the fire is being extinguished.".

9.3.x.40.2.7 Amendment does not apply to the English text.

9.3.x.40.2.14 Renumber as 9.3.x.40.2.16. Insert "9.3.x.40.2.14 *(Reserved)*".

9.3.x.40.2.15 Add a new subsection to read as follows:

"9.3.x.40.2.15 Fire-fighting systems using K_2CO_3 as the extinguishing agent

In addition to the requirements laid down in 9.3.x.40.2.1 to 9.3.x.40.2.3, 9.3.x.40.2.5, 9.3.x.40.2.6 and 9.3.x.40.2.9, fire-fighting systems using K_2CO_3 as the extinguishing agent shall comply with the following provisions:

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* *As available on the website of the Comité Européen pour l'Élaboration de Standards dans le Domaine de Navigation Intérieure – CESNI, https://www.cesni.eu/en/documents/es-trin/.*

(a) The fire-fighting system shall have a type-approval pursuant to Directive 2014/90/EU[1] or to MSC/Circ. 1270[2];

(b) Each room shall be provided with its own firefighting system;

(c) The extinguishing agent must be stored in specially provided unpressurised tanks in the room to be protected. These tanks shall be fitted in such a way that the extinguishing agent is dispensed evenly in the room. In particular the extinguishing agent shall also work underneath the deck plates;

(d) Each tank is separately connected with the triggering device;

(e) The quantity of dry aerosol-forming extinguishing agent relative to the room to be protected shall be at least 120 g per m^3 of the net volume of this room. This net volume is calculated according to Directive 2014/90/EU[1] or to MSC/Circ. 1270[2]. It shall be possible to supply the extinguishing agent within 120 s.".

9.3.1.41.3, 9.3.2.41.3 and 9.3.3.41.3 Amend to read as follows: "Only electrical lamps are permitted.".

9.3.1.50, 9.3.2.50 and 9.3.3.50 Delete and insert "*(Deleted)*".

9.3.1.51 and 9.3.2.51 Amend to read as follows:

"**Surface temperatures of installations and equipment**

(a) Surface temperatures of electrical and non-electrical installations and equipment shall not exceed 200 °C.

(b) Surface temperatures of the outer parts of engines and of their air inlets and exhaust ducts shall not exceed 200 °C;

(c) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances for which the temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, then the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6) respectively;

(d) (a) and (b) do not apply if the following requirements are met (see also 7.2.3.51.4):

(i) Accommodation, wheelhouse and service spaces where surface temperatures higher than those mentioned in (a) and (b) occur are equipped with a ventilation system according to 9.3.x.12.4 (b); or

(ii) Installations and equipment which generate surface temperatures higher than those set out in (a) or (b), respectively, must be capable of being shut down. Such installations and equipment shall be marked in red.".

9.3.1.51.1, 9.3.1.51.2 and 9.3.1.51.3 Delete.

9.3.1.52, 9.3.2.52 and 9.3.3.52 Amend the heading to read as follows:

"Type and location of electrical installations and equipment".

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[1] *Official Journal of the European Union, L 257 of 28 August 2014, p.146.*

[2] *International Maritime Organization Circular MSC/Circ. 1270 and corrigenda — Revised Guidelines for the approval of fixed aerosol fire-extinguishing systems equivalent to fixed gas extinguishing systems, as referred to in SOLAS 1974, for machinery spaces — adopted on 29 August 2008.*

[1] *Official Journal of the European Union, L 257 of 28 August 2014, p.146.*

[2] *International Maritime Organization Circular MSC/Circ. 1270 and corrigenda — Revised Guidelines for the approval of fixed aerosol fire-extinguishing systems equivalent to fixed gas extinguishing systems, as referred to in SOLAS 1974, for machinery spaces — adopted on 29 August 2008.*

9.3.1.52.1, 9.3.2.52.1 and 9.3.3.52.1 Amend to read as follows:

"Electrical installations and equipment shall be of at least the 'limited explosion risk' type.".

This provision does not apply to:

(a) Lighting installations in the accommodation and the wheelhouse, except for switches near to the entrances;

(b) Mobile phones, fixed telephone installations, stationary and portable computers and loading instruments in the accommodation or the wheelhouse;

(c) Electrical installations and equipment which, during a stay in the immediate vicinity of or within a shoreside assigned zone:

(i) Are extinguished; or

(ii) Are placed in premises equipped with a ventilation system according to 9.3.x.12.4;

(d) To radiotelephone installations and inland AIS (automatic identification systems) stations in the accommodation and the wheelhouse, if no part of an aerial for radiotelephone installations or AIS stations is situated above or within 2.00 m of the cargo area.".

9.3.1.52.2, 9.3.2.52.2 and 9.3.3.52.2 Amend to read as follows:

"In the cofferdams, double-hull spaces, double bottoms and hold spaces, only hermetically sealed echo sounding devices are allowed, the cables of which are led through thick-walled steel tubes with gastight connections up to the main deck.".

9.3.1.52.3, 9.3.2.52.3 and 9.3.3.52.3 Amend to read as follows:

"The fixed electrical installations and equipment which do not meet the requirements set out in 9.3.x.51 (a), 9.3.x.51 (b) and 9.3.x.52.1 above and their switches shall be marked in red. The disconnection of such equipment shall be controlled from a centralized location on board.".

9.3.1.52.4, 9.3.2.52.4 and 9.3.3.52.4 Amend to read as follows:

"Every insulated distribution network shall be fitted with an automatic device with a visual and audible alarm for checking the insulation level.".

9.3.1.52.5, 9.3.2.52.5 and 9.3.3.52.5 Amend to read as follows:

"Only distribution systems without return connection to the hull are permitted. This provision does not apply to:

- Active cathodic corrosion protection;
- Certain limited sections of the installations situated outside the cargo area (e.g., connections of starters of diesel engines);
- The device for checking the insulation level referred to in 9.3.x.52.4.".

9.3.1.52.6, 9.3.2.52.6 and 9.3.3.52.6 Amend to read as follows:

"An electric generator which is permanently driven by an engine and which does not meet the requirements of 9.3.x.52.1 above, shall be fitted with a switch capable of shutting down the generator. A notice board with the operating instructions shall be displayed near the switch.".

9.3.1.52.7, 9.3.2.52.7 and 9.3.3.52.7 Amend to read as follows:

"Failure of the power supply for the safety and control equipment shall be immediately indicated by visual and audible signals in the wheelhouse and on the deck. The alarm must be relayed to the accommodation automatically if it has not been switched off.".

9.3.1.52, 9.3.2.52 and 9.3.3.52 Insert the following new paragraphs:

"9.3.x.52.8 Electrical switches, sockets and cables on deck shall be protected against mechanical damage.

9.3.x.52.9 Sockets for the connection of signal lights and gangway lighting shall be solidly fitted to the vessel close to the signal mast or the gangway. The sockets used in this area shall be designed so as to prevent connection or disconnection except when they are not live.

9.3.x.52.10 Accumulators shall be located outside the cargo area.".

9.3.1.53, 9.3.2.53 and 9.3.3.53, title Amend the heading to read as follows:

"**Type and location of electrical and non-electrical installations and equipment intended to be used in explosion hazardous areas**".

9.3.1.53.1, 9.3.2.53.1 and 9.3.3.53.1 Amend to read as follows:

"On board vessels covered by the classification of zones as defined in 1.2.1, electrical and non-electrical installations and equipment used in explosion hazardous areas shall meet at least the requirements for use in the area concerned.

They shall be selected on the basis of the explosion groups/subgroups and temperature classes to which the substances to be carried belong (see columns (15) and (16) of Table C of Chapter 3.2).

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances for which temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, then the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6).

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances for which temperature classes T1 or T2 are indicated in column (15) of Table C of Chapter 3.2, then the corresponding surface temperatures within the assigned zones shall not exceed 200 °C.".

9.3.1.53.2, 9.3.2.53.2 and 9.3.3.53.2 Amend to read as follows:

"Except in the case of optical fibres, electrical cables shall be armoured or placed in a metallic sheath or in protective tubes.

Electrical cables for the active cathodic protection of the shell plating shall be led through thick-walled steel tubes with gastight connections up to the main deck.".

9.3.x.53.3 Amend to read as follows:

"Movable electric cables are prohibited in the explosion danger area, except for electric cables for intrinsically safe electric circuits or for connecting:

(a) Signal lights and lighting for gangways, provided the connection point (for example, the socket) is permanently fitted to the vessel close to the signal mast or gangway;

(b) The power network on a vessel to a land-based power network; provided

- The electric cables and the power supply unit conform with a valid standard (for example, EN 15869-03: 2010);
- The power supply unit and connectors are located outside of the explosion danger area.

Connecting and disconnecting sockets/connectors shall only be possible when they are not live.".

9.3.1.53.4, 9.3.2.53.4 and 9.3.3.53.4 Amend to read as follows:

"Electrical cables of intrinsically safe circuits shall be separated from other cables not intended for use in such circuits and shall be marked (they shall not be installed together in the same string of cables and they shall not be fixed by the same cable clamps).".

9.3.x.53.5 Insert the following new paragraph:

"9.3.x.53.5 For movable electrical cables permitted under 9.3.x.53.3, only sheathed cables of type H07RN-F in accordance with standard IEC 60245-4:2011[*] or electrical cables of at least equivalent design having conductors with a cross-section of not less than 1.50 mm^2 shall be used.".

9.3.x.54 Insert the following new paragraphs:

"**9.3.x.54** ***Earthing***

9.3.x.54.1 The metal parts of electrical installations and equipment in the cargo area which are not live, as well as the protective metal tubes or metal sheaths of cables, in normal service shall be earthed, unless they are so arranged that they are automatically earthed by bonding to the metal structure of the vessel.

9.3.x.54.2 The provisions of 9.3.x.54.1 also apply to installations with a voltage of less than 50 Volts.

9.3.x.54.3 Independent cargo tanks, metal intermediate bulk containers and tank-containers shall be earthed.

9.3.x.54.4 Receptacles for residual products shall be capable of being earthed.".

9.3.x.54 Replace "9.3.x.54-9.3.x.55 *(Reserved)*" by "9.3.x.55 *(Reserved)*".

9.3.x.56 Delete and insert "*(Deleted)*".

9.3.x.56.1, 9.3.x.56.2, 9.3.x.56.3, 9.3.x.56.4, 9.3.x.56.5, 9.3.x.56.6 Delete.

9.3.x.60 Add the following text after the first sentence:

"The water shall meet the quality of drinking water on board.

NOTE: *Additional decontamination substances for the purpose of avoiding corrosion of eyes and skin are allowed.*

A connection of this special equipment with the area outside the cargo zone is accepted.

A spring-loaded non-return valve shall be fitted to ensure that no gases can escape through the shower and the eye and face bath system outside the cargo area.".

9.3.1 and 9.3.2 Insert "9.3.x.61 *(Reserved)*".

[*] *Identical to EN 50525-2-21: 2011.*

9.3.1, 9.3.2 and 9.3.3 Add a new 9.3.x.62 to read as follows:

"**9.3.x.62** ***Valve for degassing to reception facilities***

A permanently installed or portable spring-loaded low-pressure valve used during degassing operations to reception facilities, shall be fitted at the piping used to extract air. If the vessel's substance list, according to 1.16.1.2.5, contains substances for which explosion protection is required according to column (17) of Table C of Chapter 3.2, this valve shall be fitted with a flame arrester capable of withstanding a deflagration. When the vessel is not degassing to a reception facility, the valve shall be closed with a blind flange. The low-pressure valve shall be so installed that under other normal working conditions the vacuum valve is not activated.

NOTE: *Degassing operations are part of normal working conditions.*".

9.3.1, 9.3.2 and 9.3.3 Replace "9.3.x.61 to 9.3.x.70 *(Reserved)*" by "9.3.x.63 to 9.3.x.70 *(Reserved)*".

9.3.2.10.3 and 9.3.3.10.3 Amend to read as follows:

"If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the use of installations and equipment that are not of at least the 'limited explosion risk' type is not permitted during loading and unloading operations in parts of the deck outside the cargo area, unless those parts are protected against the penetration of gases and liquids by a gas- and liquid-tight protection wall. The wall must either extend over the full width of the vessel or surround the areas to be protected in a U-shaped form. The wall must cover the whole width of the area to be protected and at least 1.00 m in the direction opposite to the cargo area (see Classification of zones diagram). The height of the wall shall be at least 1.00 m above the adjacent cargo deck area in the cargo area. The outer wall and side walls of the accommodation can be considered as a protection wall if they do not include openings and if the dimensions are complied with.

A protection wall is not required where the distance between the areas to be protected and the high velocity vent valve, the shore connections of the piping for loading and unloading, the compressor on deck and the opening of the closest pressure tanks is at least 12.00 m.".

9.3.2.11.2 (a) In the second paragraph, replace "9.3.2.11.7" by "9.3.2.11.8". Delete the final sentence: "Refrigerated cargo tank fastenings shall meet the requirements of a recognised classification society.".

9.3.2.11.2 (b) At the end, add the following sentence: "Refrigerated cargo tank fastenings shall meet the requirements of a recognised classification society.".

9.3.2.11.2 (c) Amend to read as follows:

"(c) A local recess in the cargo deck, contained on all sides, with a depth greater than 0.10 m, designed to house the cargo pump, is permitted if it fulfils the following conditions:

- The recess shall not be greater than 1.00 m in depth;
- The recess shall be located not less than 6.00 m from entrances and openings to accommodation and service spaces outside the cargo area;
- The recess shall be located at a minimum distance from the side plating equal to one quarter of the vessel's breadth;
- All pipes linking the recess to the cargo tanks shall be fitted with shut-off devices fitted directly on the bulkhead;
- All the controls required for the equipment located in the recess shall be activated from the deck;

- It shall be possible to drain the recess using a system installed on deck in the cargo area and independent of any other system;
- The recess shall be provided with a level alarm device which activates the draining system and triggers a visual and audible alarm in the wheelhouse and on the deck when liquid accumulates at the bottom;
- When the recess is located above the cofferdam, the engine room bulkhead shall have an insulation of Class "A-60" as defined in SOLAS 74, Chapter II-2, Regulation 3;
- When the cargo area is fitted with a water-spray system, electrical equipment located in the recess shall be protected against infiltration of water;
- Pipes connecting the recess to the hull shall not pass through the cargo tanks.".

9.3.2.11.2 Add the following new paragraph (f) at the end:

"(f) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2 and the recess is deeper than 0.50 m, then it shall be provided with a permanent gas detection system which automatically indicates the presence of flammable gases by means of direct-measuring sensors and actuates a visual and audible alarm when the gas concentration has reached 20 % of the LEL of the cargo or 20 % of the LEL of n-Hexane, whichever is the more critical value. The sensors of this system shall be placed at suitable positions at the bottom of the recess.

Measurement shall be continuous.

Visual and audible alarms shall be installed in the wheelhouse and on deck and, when the alarm is actuated, the vessel loading and unloading system shall be shut down. Failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by means of visual and audible alarms.".

9.3.2.11.2 Add a new paragraph at the end to read as follows:

"The alarm shall be automatically relayed to the accommodation if it has not been switched off.".

9.3.2.11.3 (a) and 9.3.3.11.3 (a) Amend the one but last sentence to read as follows: "In this case an end bulkhead of Class "A-60" as defined in SOLAS 74, Chapter II-2, Regulation 3, shall be deemed equivalent to a cofferdam.".

9.3.2.12.7 Delete and insert "*(Deleted)*".

9.3.2.17.5 (d) Amend the last sentence to read as follows: "Penetrations through a bulkhead of Class "A-60" as defined in SOLAS 74, Chapter II-2, Regulation 3, shall have an equivalent fire protection.".

9.3.2.17.6 and 9.3.3.17.6 Amend to read as follows:

"A service space located within the cargo area below deck shall not be used as a cargo pump-room for the loading and unloading system, except where:

- The cargo pump-room is separated from the engine room or from service spaces outside the cargo area by a cofferdam or a bulkhead with an insulation of Class "A-60" as defined in SOLAS 74, Chapter II-2, Regulation 3, or by a service space or a hold space;
- The 'A-60' bulkhead required above does not include penetrations referred to in 9.3.x.17.5 (a);

- Ventilation exhaust outlets are located not less than 6.00 m from entrances and openings of the accommodation, wheelhouse and service spaces outside the cargo area;
- The access hatches and ventilation inlets can be closed from the outside;
- All piping for loading and unloading as well as that of stripping systems is provided with shut-off devices at the pump suction side in the cargo pump-room immediately at the bulkhead. The necessary operation of the control devices in the pump-room, starting of pumps and control of the liquid flow rate shall be effected from the deck;
- The bilge of the cargo pump-room is equipped with a gauging device for measuring the filling level which activates a visual and audible alarm in the wheelhouse when liquid is accumulating in the cargo pump-room bilge;
- The cargo pump room is provided with a permanent oxygen detection system which automatically indicates the amount of oxygen and which actuates a visual and audible alarm when the oxygen concentration has reached 19.5 % by volume. The sensors of this system shall be placed at suitable positions at the bottom and at a height of 2.00 m. Measurement shall be continuous and displayed near to the entrance. Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down;

  Failure of the oxygen measuring system shall activate a visual and audible alarm in the wheelhouse and on deck. The alarm must be relayed to the accommodation automatically if it has not been switched off;
- The ventilation system prescribed in 9.3.x.12.3 has a capacity sufficient to ensure not less than 30 changes of air per hour based on the total volume of the service space.

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the cargo pump room shall also be provided with a permanent gas detection system which automatically indicates the presence of flammable gases and actuates a visual and audible alarm when the gas concentration has reached 20 % of the LEL of the cargo or 20 % of the LEL of n-Hexane, whichever gives the more critical value.

The sensors of this gas detection system shall be placed at suitable positions at the bottom and directly below the deck. Measurement shall be continuous and displayed near to the entrance.

Audible and visual alarms shall be installed in the wheelhouse and in the cargo pump-room and, when the alarm is actuated, the loading and unloading system shall be shut down.

Any failure of the gas detection system shall be immediately signalled in the wheelhouse and on deck by a visual and audible warning. The alarm must be relayed to the accommodation automatically if it has not been switched off.".

9.3.2.20.4 and 9.3.3.20.4 Amend to read as follows:

"If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2 then the ventilation openings of cofferdams shall be fitted with a flame arrester capable of withstanding a deflagration. The flame arresters shall be chosen according to the explosion groups/subgroups of the substances foreseen for inclusion in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2).".

9.3.2.21.1 (f) and 9.3.3.21.1 (f) Amend to read as follows:

"(f) An instrument for measuring the temperature of the cargo, if in column (9) of Table C of Chapter 3.2, a cargo heating installation or a possibility of heating the cargo is required on board, or if a maximum temperature is indicated in column (20) of Table C of Chapter 3.2;".

9.3.2.21.1 (g) and 9.3.3.21.1 (g) Amend to read as follows:

"(g) A connection for a closed-type or partly closed-type sampling device, and/or at least one sampling opening as required in column (13) of Table C of Chapter 3.2;

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the flame arrester plate stack capable of withstanding steady burning of the sampling opening shall be selected according to the explosion groups/subgroups of the substances foreseen for inclusion in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2).".

9.3.2.21.7 and 9.3.3.21.7 Amend to read as follows:

"When the pressure or temperature exceeds a set value, instruments for measuring the vacuum or overpressure of the gaseous phase in the cargo tank or the temperature of the cargo shall activate a visual and audible alarm in the wheelhouse and on deck. The alarm must be relayed to the accommodation automatically if it has not been switched off.

When the pressure exceeds the set value during loading and unloading, the instrument for measuring the pressure shall, by means of the plug referred to in 9.3.x.21.5 above, immediately initiate an electrical contact which shall put into effect measures to interrupt the loading or unloading operation. When the vessel's own discharge pump is used, it shall be switched off automatically.

The instrument for measuring the overpressure or vacuum shall activate the alarm at latest when:

(a) An overpressure equal to 1.15 times the opening pressure of the pressure relief valves/high velocity vent valves is reached; or

(b) The lower threshold of the design pressure of the vacuum valves, but not exceeding a vacuum of 5 kPa (0.05 bar), is reached.

The maximum permissible temperature is indicated in column (20) of Table C of Chapter 3.2. The sensors for the alarms mentioned in this paragraph may be connected to the alarm device of the sensor.

When it is prescribed in column (20) of Table C of Chapter 3.2, the instrument for measuring the overpressure of the gaseous phase in the cargo tank shall actuate a visible and audible alarm in the wheelhouse when the overpressure exceeds 40 kPa (0.4 bar) during the voyage. The alarm must be relayed to the accommodation automatically if it has not been switched off. It shall be possible to read the gauges in direct proximity to the control for the water spray system.".

9.3.2.21.9, first paragraph In the first sentence, replace "quick-action stop valve" by "quick closing valve". In the second sentence, replace "switch" by "switches".

9.3.2.22.4 Amend to read as follows:

"(a) Each cargo tank or group of cargo tanks connected to a common venting piping shall be fitted with:

- A connection for the safe return ashore of gases expelled during loading;

- A safe depressurization device for the cargo tanks, on which the position of the shut-off valve indicates clearly whether it is open or shut;
- Safety devices for preventing unacceptable overpressures or vacuums.

  The opening pressure of the safety valves shall be permanently marked on the valves;

  The setting of the pressure relief valves shall be such that during the transport operation they do not blow off until the maximum permissible working pressure of the cargo tanks is reached;

  The gases shall be discharged upwards;

  The outlets of the pressure relief valves shall be located not less than 1.00 m above the deck and at a distance of not less than 6.00 m from the openings of accommodation, the wheelhouse and the service spaces outside the cargo area. No equipment shall be present in a circle of 1.00 m radius around the outlet of the pressure relief valve outlets. This area shall be marked as a danger zone;

(b) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then at the connection to each cargo tank, the venting piping and the vacuum valve shall be equipped with a flame arrester capable of withstanding a detonation;

(c) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, or for which there is a T in column (3b) of Table C of Chapter 3.2, then the pressure relief valve shall be designed as a high velocity vent valve;

(d) If a shut-off device is to be mounted between the venting piping and the cargo tank, it shall be placed between the cargo tank and the flame arrester, and each cargo tank shall be equipped with pressure relief valves;

(e) The autonomous protection system mentioned in (c) shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2). The outlets of the high-velocity vent valves shall be located not less than 2.00 m above the deck and at a distance of not less than 6.00 m from the openings of the accommodations, the wheelhouse and the service spaces outside the cargo area. This height may be reduced to 1.00 m when there is no equipment and no work is being carried out within a radius of 1.00 m around the pressure relief valve outlet. This area shall be marked as a danger zone;

If the high velocity vent valve, the vacuum valve, the flame arresters and the venting piping are required to be heatable, the devices concerned shall be suitable for the relevant temperature.".

9.3.2.22.5 and 9.3.3.22.5 Amend to read as follows:

"**Venting piping**

(a) When two or more cargo tanks are connected to common venting piping, it is sufficient that the equipment according to 9.3.x.22.4 (safety valves to prevent unacceptable overpressures and vacuums, high velocity vent valve, vacuum valve protected against deflagrations, safe pressure relief device for cargo tanks protected against deflagrations) is installed on the joint venting piping (see also 7.2.4.16.7);

(b) When each cargo tank is connected to its own venting piping, each cargo tank or the associated venting piping shall be equipped according to 9.3.x.22.4.".

9.3.2.25.9 Amend the final sentence to read as follows:

"Instructions concerning the permissible maximum loading and unloading flows for each cargo tank or for each group of cargo tanks shall be carried on board.".

9.3.2.25.9 and 9.3.3.25.9 Amend as follows:

- Replace "overpressure: 115 % of the opening pressure of the high velocity vent valve" by "overpressure: 1.15 times the opening pressure of the pressure relief valve/high velocity vent valve".
- Replace "vacuum pressure: not more than the construction vacuum pressure but not exceeding 5 kPa (0.05 bar)" by "vacuum pressure: not more than the design pressure, but not exceeding a vacuum of 5 kPa (0.05 bar).".

9.3.2.26 and 9.3.3.26 Amend the heading to read as follows: "Residual cargo tanks and receptacles for residual products".

9.3.2.26.1 and 9.3.3.26.1 Amend to read as follows:

"When vessels are provided with tanks for residual products or receptacles for residual products, they shall be located in the cargo area and comply with the provisions of 9.3.x.26.2 and 9.3.x.26.3. Receptacles for residual products shall be located only in the cargo area on deck and not less than a quarter of the vessel's breadth from the outer shell.".

9.3.2.26.2 Amend to read as follows:

"Tanks for residual products shall be equipped with:

- A level gauge;
- Connections, with stop valves, for pipes and hose assemblies;
- A pressure relief/vacuum valve;

The pressure relief valve shall be sized so that, during the transport operation, it does not open when in normal operation. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substances to be carried.

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the vacuum valve shall be designed so as to be capable of withstanding a deflagration. The deflagration safety may also be ensured by a flame arrester.

If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, or for which there is a T in column (3b) of Table C of Chapter 3.2, then the pressure relief valve shall be designed as a high velocity vent valve.

The pressure relief valve shall be sized so that, during the transport operation, it does not open when in normal operation. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substance to be carried.

The high velocity vent valve and the deflagration safe vacuum valve shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2).

The maximum permissible capacity is 30 m^3.".

9.3.2.26.3 and 9.3.3.26.3 Amend to read as follows:

"The receptacles for residual products shall be equipped with:

- A possibility of indicating the degree of filling;
- Connections, with stop valves, for pipes and hose assemblies;
- A connection enabling gases released during filling to be evacuated safely.".

9.3.2.26.4 and 9.3.3.26.4 Delete and insert "*(Deleted)*".

9.3.2.28 In the first sentence, replace "and to cool" by "or to cool" and "of the high velocity vent valves" by "of the pressure relief valves/high velocity vent valves".

9.3.2.40.1 In the second indent, first paragraph, delete "or wheelhouse". In the second paragraph, insert ", wheelhouse" after "into the accommodation".

9.3.2.42.4 and 9.3.3.42.4 In the first sentence, replace "gas-freeing" by "degassing with a concentration given off by the cargo of 10 % of the LEL or above".

9.3.2.51.1, 9.3.2.51.2 and 9.3.2.51.3 Delete.

9.3.3.8.4 Amend to read as follows:

"9.3.3.8.4 The conformity of the documents required in 8.1.2.3 (r) to (v) with the circumstances on board shall be inspected by a recognized classification society, an inspection body or by a person authorized for that purpose by the competent authority whenever the certificate of approval is renewed and, in addition, once during the third year of validity of the certificate of approval. A signed certificate must be available on board.".

9.3.3.10.5 Amend to read as follows:

"9.3.3.10.5 The bulwarks, foot-rails, etc. shall be provided with sufficiently large openings which are located directly above the deck.".

9.3.3.10 Add the following new paragraph:

"9.3.3.10.6 Open Type N vessels are only required to meet the requirements of 9.3.3.10.1 if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.".

9.3.3.11.2 Add new subparagraphs(c) and (d) to read as follows:

"(c) *(Reserved)*;

(d) Side-struts linking or supporting the load-bearing components of the sides of the vessel with the load-bearing components of the longitudinal walls of cargo tanks and side-struts linking the load-bearing components of the vessel's bottom with the tank-bottom are prohibited.".

9.3.3.12.3 Amend to read as follows:

"(a) A service space located within the cargo area below deck shall be provided with a ventilation system. The capacity of the fans shall be sufficient to ensure 20 complete changes of air per hour based on the volume of the service space.

The ventilation exhaust ducts shall extend down to 50 mm above the bottom of the service space. The air shall be supplied through a duct at the top of the service space.

(b) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the air inlets shall be located not less than 2.00 m above the deck, at a distance of not less than 2.00 m from tank openings and 6.00 m from the outlets of safety valves.

The extension pipes which may be necessary may be of the hinged type.

(c) On board open Type N vessels, other suitable installations without ventilator fans shall be sufficient.".

9.3.3.12.7 Amend to read as follows:

"9.3.3.12.7 Open Type N vessels are only required to meet the requirements of 9.3.3.12.4 (b) or (c) if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.".

9.3.3.12.8 Delete: "9.3.3.12.5,".

9.3.3.17.8 After "9.3.3.17.6", insert "except for the permanent oxygen measuring system".

9.3.3.20.5 Amend to read as follows:

"9.3.3.20.5 9.3.3.20.2 above does not apply to oil separator and supply vessels.".

9.3.3.22.4 Amend to read as follows:

"Each cargo tank or group of cargo tanks connected to a common venting piping shall be fitted with:

Open Type N:

- Devices to prevent unacceptable overpressures or vacuums and constructed so as to prevent any accumulation of water and penetration of water into the cargo tank.

Open Type N with flame arresters:

- Devices to prevent unacceptable overpressures or vacuums, equipped with flame arresters capable of withstanding steady burning and constructed so as to prevent any accumulation of water and penetration of water into the cargo tank.

Closed Type N:

(a) A connection for the safe return ashore of gases expelled during loading;

(b) A safe depressurization device for the cargo tanks, on which the position of the shut-off valve indicates clearly whether it is open or shut;

(c) Safety valves for preventing unacceptable overpressures or vacuums;

The opening pressure of the safety valves shall be marked indelibly on the valves;

(d) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then:

- At the connection to each cargo tank, the venting piping shall be equipped with a flame arrester capable of withstanding a detonation;
- The vacuum valve and the safe depressurization device for cargo tanks shall be deflagration safe. The deflagration safety may also be ensured by a flame arrester; and
- The pressure relief device shall be designed as a high velocity vent valve, with the gases discharged upwards;

The setting of the pressure relief valves shall be such that during the transport operation they do not blow off until the maximum permissible working pressure of the cargo tanks is reached;

The autonomous protection systems shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2);

If the high velocity vent valve, the vacuum valve, the flame arresters and the venting piping are required to be heatable for carriage, the safety devices concerned shall be suitable for the relevant temperature;

The opening pressure of the pressure relief valves, the vacuum valve and the high velocity vent valves shall be marked indelibly on the valves;

If a shut-off device is to be mounted between the venting piping and the cargo tank, it shall be placed between the cargo tank and the flame arrester, and each cargo tank shall be equipped with pressure relief valves;

(c) The outlets of the pressure relief devices/high velocity vent valves shall be located not less than 2.00 m above the deck and at a distance of not less than 6.00 m from the openings of the accommodations, the wheelhouse and the service spaces outside the cargo area. This height may be reduced to 1.00 m when there is no equipment and no work is being carried out within a radius of 1.00 m around the pressure relief valve outlet. This area shall be marked as a danger zone.".

9.3.3.22.6 Delete: ", 9.3.3.22.4 (b)".

9.3.3.25.9 Delete "For open type N with flame arrester and open type N, the loading and unloading flows depend on the total cross-section of the exhaust ducts.". In subparagraph 4, replace "of the flame arrester" by "of the flame arresters".

9.3.3.25.9 Amend the final sentence to read as follows:

"Instructions concerning the permissible maximum loading and unloading flows for each cargo tank or for each group of cargo tanks shall be carried on board.".

9.3.3.25.12 Delete: ", 9.3.3.25.3".

9.3.3.26.2 Amend to read as follows:

"Tanks for residual products shall be equipped with:

In the case of an open system:

- An ullage opening;
- Connections, with stop valves, for pipes and hose assemblies;
- A device for ensuring pressure equilibrium.

In the case of an open system with flame arrester:

- An ullage opening;
- Connections, with stop valves, for pipes and hose assemblies;
- A device for ensuring pressure equilibrium, fitted with a flame arrester capable of withstanding steady burning.

In the case of a closed system:

(a) A level indicator;

- Connections, with stop valves, for pipes and hose assemblies;
- A vacuum valve and a pressure relief valve;

The pressure relief valve shall be sized so that, during the transport operation, it does not open when in normal operation. This condition is met when the opening pressure of the valve meets the conditions required in column (10) of Table C of Chapter 3.2 for the substance to be carried;

(b) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then the pressure relief valve shall be a high velocity vent valve and the vacuum valve shall be deflagration safe. The deflagration safety may also be ensured by a flame arrester;

The high velocity vent valve and the deflagration safe vacuum valve shall be chosen according to the explosion groups/subgroups of the substances listed in the list of substances on the vessel (see column (16) of Table C of Chapter 3.2).

The maximum permissible capacity is 30 m^3.".

9.3.3.26.5 Amend to read as follows:

"9.3.3.26.5 9.3.3.26.1, 9.3.3.26.2 (final sentence) and 9.3.3.26.3 do not apply to oil separator vessels.".

9.3.3.28 Replace "of the high velocity vent valve" by "of the pressure relief valves/high velocity vent valves".

9.3.3.51 Amend to read as follows:

"**Surface temperatures of installations and equipment**

(a) Surface temperatures of electrical and non-electrical installations and equipment shall not exceed 200 °C;

(b) Surface temperatures of the outer parts of engines and their air inlets and exhaust ducts shall not exceed 200 °C;

(c) If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances for which the temperature classes T4, T5 or T6 are indicated in column (15) of Table C of Chapter 3.2, then the corresponding surface temperatures within the assigned zones shall not exceed 135 °C (T4), 100 °C (T5) or 85 °C (T6), respectively;

(d) (a) and (b) do not apply if the following requirements are met (see also 7.2.3.51.4):

(i) Accommodation, wheelhouse and service spaces where surface temperatures higher than those mentioned in (a) and (b) occur are equipped with a ventilation system according to 9.3.x.12.4 (b); or

(ii) Installations and equipment which generate surface temperatures higher than those set out in (a) or (b), respectively, must be capable of being shut down. Such installations and equipment shall be marked in red;

(e) Open Type N vessels are only required to meet the requirements of (a), (b) and (d) if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.".

9.3.3.51.1, 9.3.3.51.2 and 9.3.3.51.3 Delete.

9.3.3.52 Insert the following new paragraph:

"9.3.3.52.11 Open Type N vessels are only required to meet the requirements of 9.3.3.52.1 and 9.3.3.52.3 if the vessel remains in the immediate vicinity of or within a shoreside assigned zone.".

9.3.3 Add a new paragraph 9.3.3.61 to read as follows:

"9.3.3.61 9.3.3.60 above does not apply to oil separator and supply vessels.".